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Features of a Non-ferrous Metal Foundry

Cost of Handling Reduced to Minimum— Melting Equipment Located at Center— Fumes and Smoke Satisfactorily Removed

BY F. L. PRENTISS*

THE outstanding features of the new jobbing brass and aluminum foundry of the National Bronze & Aluminum Foundry Co., Cleveland, are the arrangements for the reduction of the cost of handling material to a minimum, the location of the melting equipment in the center of the foundry and the method of providing ventilation for carrying away the fumes from the furnaces.

The plant includes a main building 150 x 250 ft., a cleaning and shipping room on one side 80 x 100 ft., and a sand mixing room 20 x 100 ft. adjoining the core room, part of which is used for core room purposes.

The plant is designed for mass production work and has sufficient flexibility to permit its use for making either heavy or light castings with equal facility. It is so laid out that all of the production departments are virtually in one room, and the superintendent, from points near the center of the foundry, has a good view of all departments. The casting goes in turn from the

The Melting Equipment Is Located at the Center of the Foundry to Reduce the Distance the Metal Has to Be Carried to the Molds. The crucibles are arranged in a double row in the pit and the fumes from the furnaces are carried out through a hood and ventilating stack in the roof above the crucible furnaces. Other melting equipment is located at the right of the crucibles, only one group of these appearing in the picture

*Resident editor of THE IRON AGE at Cleveland.

molders' floor to the shake-out room, finishing department, sand blast and shipment room, all on one floor. With continuous glass sections in the side walls the lighting facilities are unusually good. The plant has a daily capacity of 16 tons of aluminum and 50 tons of brass castings.

The advantage of locating the melting department in the center of the main building is in the reduction of the distance the metal has to be carried to the molding floors which surround the melting furnaces. The average distance that crucibles of metal are carried from the furnaces to the molds is 75 ft., and 100 molding floors can be reached in that distance. Two jib cranes attached to the building columns handle the crucibles. With the convenient arrangement of the foundry and the short distances that the metal is carried, the management states that the cost of non-productive labor, which includes all labor except molders and core makers, has been reduced 50 per cent from that in its former plant.

The Arrangements for Lighting and Convenient Handling of Machines and Materials Are Apparent in the General View of the Foundry Floor

The Smaller View Covers a Part of the Cleaning Department. The rough castings are placed in a bin back of each grinding machine. When the operator finishes a piece he places it on a cleaning table at the side of the machine, where any filing necessary is done

For melting brass there are 30 oil-fired, pit type, crucible furnaces with No. 80 crucibles. About 300 lb. of brass is melted in each crucible. The crucibles are arranged in a double row in a pit, instead of in the usual one row. The pit, of concrete construction, is 45 ft. long, 10 ft. 6 in. wide and 18 in. deep. Between the two rows of furnaces is a concrete covered manifold that supplies the furnaces with air. The oil lines are carried above the manifold. The control of both air and oil is at each end of the pit. A special feature of the furnace arrangement is the provision of a pit, 6 ft. deep, that extends under the furnace pit. Under each crucible is a hole 4½ in. in diameter. Through this the metal passes in case a crucible breaks, and is deposited in a compartment in the pit beneath, from which it is later recovered. With this arrangement interference with operations of other furnaces should a crucible break is avoided, and the escaped metal does not spread out in the bottom of the pit and become mixed with the dirt under the furnace.

Fumes from the furnaces are carried from the foundry through a ventilating stack 10 x 16 ft. that extends up to the roof and is connected at the bottom to a hood 50 ft. long and 20 ft. wide extending down in the trusses directly over the furnace pit. Sufficient air comes in from the sides of the building to provide circulation and the products of combustion are carried straight up the furnace and out through the ventilating stack. As a result the foundry is remarkably free from fumes and smoke.

The melting equipment includes two large specially designed oil-fired furnaces of the reverberatory type, one of 2000 lb. capacity for melting aluminum and the other with melting capacity of about 2 tons for brass, these being used for production work, three roll-over brass melting furnaces and a Booth electric furnace of 500-lb. capacity for melting brass. A feature of the two large reverberatory furnaces is that the dirt and slag cannot be poured out with the metal but stays in the furnace. The furnaces are cleaned every night by pouring out the refuse from the bottom of the furnace. The melting furnaces are located near the center of the foundry at the side of the pit furnaces and the fumes from the former are also carried up through the ventilating stack. They are so placed that all handling of metal from the furnaces to the molders' floors is done by hand. Practically all the molds are machine made, various types and sizes of jar ram roll-

over pattern drawing machines being used. Jar ram squeezers are provided for making smaller molds. Air hoists are used for handling the molds and shaking out castings.

The core room is equipped with eight Swartwout core type oil-fired double core ovens, 7 ft. 6 in. wide and 8 ft. 10 in. deep. Elevating trucks, both hand and electric, are used for charging these ovens. There are also three shelf type ovens, 5 ft. wide and 30 in. deep, for small cores.

The ovens are at the sides of the core room adjoining the foundry floor. The large ovens have doors on both sides so that cores, after being baked, are taken out the opposite side into the core storage room. Cores baked in the small shelf type ovens are also removed from the opposite side of the ovens, thus reducing the distance in handling. Foundry sand is unloaded from a siding only 30 ft. from the sand mixing machine.

The cleaning room is reached from the foundry floor by two aisles, one for heavy brass and aluminum castings and the other for light brass castings. On the foundry side of the cleaning room is a row of sprue cutters and band saws, the former for cutting the sprues from brass castings and the latter mostly for work on light aluminum castings. Back of the sprue cutters and band saws is a double row of grinders for grinding small brass castings. The rough castings are placed in a bin back of each grinder, and when the grinding machine operator finishes a piece he places it on a cleaning table at the side of the machine, where the filing is done. With this arrangement of the cleaning room the superintendent can see at a glance if any employee is lagging. Air hammers are provided on the side of the cleaning room where the heavy work is handled, for chipping the heavy brass and aluminum castings.

From the cleaning-up tables the brass castings go to the sand blast machine back of the grinders for the final cleaning operation. This machine has two combined cleaning units consisting of a rotary table for small work and a sand blast room for large work. The machine is furnished by the MacLeod Co.

NICKEL AND COBALT IN IRON

German Experiments on Iron Castings—Nickel Improves Physical Properties

Two authors, Prof. O. Bauer and Dr. E. Piwowarsky, in an article in *Stahl und Eisen*, Sept. 30, 1920, discuss the effect of nickel and cobalt on cast iron based on experiments which they conducted. It was attempted to ascertain whether the addition of these metals to cast iron had a similar effect to their addition to steel. An abstract of the original article, made by *Technical Review*, London, follows:

"The raw material used in the tests was pure Swedish charcoal pig iron containing 3.90 per cent total carbon, 2.80 per cent graphite, 0.048 per cent phosphorus, 0.18 per cent manganese, and 0.69 per cent silicon. The nickel was used in the form of electrolytic nickel. Small melts were first of all made for obtaining the cooling curves, and it was found that the nickel easily alloyed with the pig iron at a temperature that was only 50 deg. C. above the temperature of the iron. Larger melts were then made, in conical graphite crucibles of 200 mm. height and 100 mm. diam. at the top. These crucibles each contained 2250 grams of pig iron, which was then melted in a Helberger furnace with a liberal addition of graphite. They were heated 100 deg. C. above the melting point, the nickel, carefully weighed, being added in small pieces. After the mixture was thoroughly stirred with a carbon rod, the metal was poured into dry sand molds, and gave castings 20 mm. diam. and 650 mm. long. Four melts were made in this way, the first without any metallic addition, and the other three with various added percentages of nickel.

"Suitable samples were taken for purposes of analysis, tensile tests, notch-impact tests, compression tests, and Brinell hardness tests, the dimensions of the test pieces being given. The results of all the tests are given in a table. They show the best figures for about 1 per cent of nickel. The increase in bending strength as compared with the original cast iron is approximately 30 per cent; the compressive strength is increased 30 per cent, and the tensile strength by only 18 per cent. The freedom from acid decreases slightly, but not to the extent anticipated. Probably the catalytic effect of the graphite is too considerable. The following mean figures are given for a nickel addition of about 1 per cent: Per cent nickel added: 0.87; total carbon, 3.89 per cent; graphite, 2.85 per cent; graphite expressed as percentage of total carbon, 74.1; bending strength, 31.3 kg. per sq. mm.; extent of bending or deflection, 6.8 mm.; tensile strength, 12.5 kg. per sq. mm.; compressive strength, 74.75 kg. per sq. mm.; Brinell hardness, 171; specific work of impact (resilience [Charpy]), 0.43 kg. per sq. cm; per cent loss of weight of a 10 gram cube when subject to a 1 per cent solution of sulphuric acid, 14.6. On metallographic examination, all melts exhibited the normal structure of a good gray cast iron, that is, very uniformly distributed graphite needles in a ground mass of ferrite, and pearlite in the form of laminæ.

"For the manufacture of high quality castings for machine parts, gear-wheels, etc., the writers recommend a percentage of added nickel of up to 1.20 per cent.

"Two test melts with added cobalt were prepared, the percentages of cobalt being 1 per cent and 2 per cent respectively. The results show the effect of cobalt to be opposite to that of nickel. The bending strength drops considerably, and the tensile and compressive strengths exhibit a gradual decrease, while the hardness increases slightly. There is therefore no possibility of using cobalt for improving the properties of cast iron."

Steel Mill Electrical Engineers' Meeting

What is called "fuel economy day" will be a feature of the annual convention of the Association of Iron and Steel Electrical Engineers at the La Salle Hotel, Chicago, in the week of Sept. 19. On Wednesday, Sept. 21, papers are announced on fuel problems as follows:

"Waste Heat Utilization for Steam Generation," by G. R. McDermott, assistant engineer, Illinois Steel Co., South Chicago, Ill.

"Combustion Control," by W. N. Flanagan, steam engineer Ohio works, Carnegie Steel Co., Youngstown, Ohio.

"Fuel Requirements of Steel Mills," by F. E. Leahy, fuel and experiment engineer, Carnegie Steel Co., Duquesne, Pa.

After the discussion of these papers, it is proposed to take up the advantages that may be derived from the use of such appliances as CO_2 recorders, flow meters, indicating combustion pressure meters, pyrometers and regulators.

New Sales Plan of Thos. Firth & Sons

The agency arrangement for the sale of sheet steel heretofore existing between Thos. Firth & Sons, Ltd., Sheffield, Eng., and Wheelock, Lovejoy & Co., New York and Cambridge, has been terminated, and Thos. Firth & Sons have appointed as their general sales manager for the United States Horace G. Hides, Hartford, Conn., who for the past 20 years has represented Wm. Jessop & Sons.

The stock of Firth-Sheffield sheets will be carried in the warehouse of the Firth-Sterling Steel Co., 312 Hudson Street, New York, an associate company.

Thos. Firth & Sons and the Firth-Sterling Steel Co. are also opening a joint office in Hartford, Conn., where Mr. Hides will have his headquarters, and where Henry I. Moore will represent the Firth-Sterling Steel Co.

DOLLAR CONTROL

Executive Management Should Watch Purchases No Less Carefully Than Income

BY JOHN J. RALPH*

There has been a great advance in the use of past records of business in judging the effect of past measures and present happenings. Years ago it was general practice to balance books once a year. This balancing was merely a bookkeeper's proceeding. To-day in some concerns balances are drawn as often as every month, and there is a thorough examination of what may be called fixed items, to see that there has really been no change and to allow for the effects of time. It is realized that plant investment, good will, machine equipment, design and patent properties are not fixed capital, but only relatively so.

The movement of the point of exact information is toward the exact time of the happening. Occasionally the cost-keeping system is so perfect that the results of to-day are available to-morrow morning. This makes it possible to keep an exact control on the dollar that is being spent on goods going through the works.

Specialty Development

Of late years business and professional literature has been full of a developing series of specialties, which in turn have exploited the possibilities of the different departments of a business, and each in turn has insisted that it was the major and essential element of success. In many cases these widely heralded discoveries are not really new, but are popularization of principles which have been known for many years, having reached considerable perfection in certain industries and trades.

Intense study of mass production was developed to a high degree in the agricultural implement and sewing machine industries. Perhaps the pioneer of machine mass production was the fire-arms manufacturer.

Cost accounting is to-day recognized universally as absolutely essential. There have been few new principles evolved. Costs and their elements have been known by progressive men since the foundation of industry. But the practice has now been codified, the elements laid bare, and the knowledge has been made general.

Similarly, there have arisen efficiency engineering, industrial management, statistical analysis, so-called scientific salesmanship and other "isms." There has been progress, both in actual accomplishment and in dissemination of knowledge of engineering, chemistry, agriculture and other basic sciences.

The Master Faculty

Proud as is each exponent of the specialties, yet there is one faculty upon which they all depend, to which they all yield obedience, of which they all pretend knowledge, but which belongs to none of them alone and includes all of them. This is plain business judgment and initiative.

Perhaps because of the universal knowledge of the truth of this, perhaps because of its empirical nature, its exceedingly personal nature; because of the general slavery to it and the dislike for making a display of bonds, scant justice has been done to it by the various specialties. Not that he who exercises it cares, for he handles the cash and cracks the whip for the rest of the "isms."

As business increases in size it becomes necessary to develop the various specialties. The general adoption of modern methods of accounting and cost finding is a special instance of this. Their purpose is to furnish to the executive an accurate small-scale reproduction of the entire institution, so that he may follow all that is being done, and thus control it.

He it is who is responsible for the dollar, its growth and its protection. The bookkeeper tells him of what has been done. The cost-keeper brings the record up to yesterday. The efficiency engineer cares for the securing of the maximum returns on it to-day.

His is the problem of the dollar control. The height of its perfection is shown in the accuracy of the forecasts of the future and the aptness of the steps that have been made to take advantage of it. Just as the increasing size and complexity of modern business have forced the evolution of modern record keeping, so that the executive might keep track of developments, so the same cause has taken out of his hands many of the control functions which, whether he realizes it or not, are now exercised by his subordinates. His power is more and more that of mere control, of approval or of veto.

Executive Reluctant to Give Up Power

Still the old feeling of the power of the executive persists. He is reluctant to give it up, reluctant to see how he has been compelled to delegate to others. And throughout the organization there is the reluctance of the individual to see responsibility and to assume it.

Where, in the old days, judgments were made and initiative exercised by the executive, to-day he chooses between two or more alternatives offered by his subordinates. He is free, if he wishes to do so, to judge which of two different kinds of machines he will buy, but the design and manufacturing departments, by their prior decisions, have forced the type of machine he must choose.

Similarly, the sales department dictates what shall be the output of the coming years. Theirs is the responsibility of gaging the market, and of getting from the design department what they will want. Here again the executive must act, but this action is that of approval or veto. It is not an independent action. If John Fritz were alive to-day he would not design his own blowing engines, master steel maker that he was. There would be too much else for him to do, and others exist who could design as well as he.

Large decisions are made up of an infinity of smaller ones. Unless the entire organization is forward looking, and so closely knit together that the best collective judgment is used, the executive has poor alternatives from which to choose.

Bookkeeping or cost records can be a record only of what has already been done. It is necessary that the lessons contained in them be thoroughly learned, for they form the basis of future judgments. There are always hidden elements not revealed by these records. Part of these lie within the institution, part of them without. The intangible things of to-day—the happenings of to-morrow—are not to be found on a paper record. Here lies the element of speculation in business, for the business man must act and determine in advance of the actuality.

If the executive has lost much of his power to make decisions, to plan, to execute; if this has passed to his organization, it is a most important part of his duty to see that they develop the faculty of foresight, and realize the part they are actually playing in the life of the organization.

The Control Line

The cost record, the production chart, furnish the basis of control of what is going on now. The bookkeepers' record, the yearly balance sheet, tells the story of what has occurred in the past, and either justifies or condemns the errors of the past.

Where does the control of the future lie? The capable executive keeps in close touch with all parts of his organization, but there must be some particular point where all must recognize a formal control line.

The tendency is to watch carefully the point where the dollars come in. This is desirable, but they are the result of work done. The real point to watch is where the dollars go out. The incoming dollar is the fruit, the outgoing dollar is the seed, on which the institution depends for its life.

This is what makes buying so important.

Here is the logical point to control that which will happen in the future. If insistence is placed on the perfection of the methods of determining on purchases, the forethought involved, the co-operation in planning for the future, then the alternatives offered for decision will be worth while. This is the logical point from which to enforce realization of the part each one in the organization has in determining its future—the necessity of thorough work and of co-operation.

*40 Flushing Avenue, Jamaica, N. Y.

Universal Steel Classification Code

Proposed New Code to Supplant Present S. A. E. System—Claimed to Be Simpler, More Elastic and Easily Expanded

—BY HORACE C. KNERR* AND ARTHUR L. COLLINS*—

THE present system of classifying steels, known as the S. A. E. system, was inaugurated by the iron and steel division of the Society of Automotive Engineers in 1912. The idea behind this movement was to afford a code by which any steel could be designated and to indicate concisely the important elements present in the steel with the approximate amounts of each. Those behind this movement decided on numerical symbols, believing that such a system would be sufficiently comprehensive. To quote from the S. A. E. handbook:

The numeral index system adopted in the numbering of the metal specifications renders it possible to employ specification numerals on shop drawings and blueprints that are partially descriptive of the quality of material covered by such numbers. The first figure indicates the class to which the steel belongs; thus, 1 indicates a carbon steel; 2, nickel, and 3, nickel-chromium. In the case of the alloy steels, the second figure generally indicates the approximate percentage of the predominant alloying element. The last two or three figures indicate the average carbon content in "points," or hundredths of 1 per cent. Thus 2340 indicates a nickel steel with approximately 3 per cent nickel (3.25 to 3.75) and 0.40 per cent carbon (0.35 to 0.45); and 52100 indicates a chromium steel with about 2 per cent chromium (1.20 to 1.50) and 1.00 per cent carbon (0.95 to 1.10).

The basic numerals for the various qualities of steels specified follow:

Carbon steels	1	Chromium-vanadium steels	6
Nickel steels	2	Tungsten steels	7
Nickel-chromium steels	3	Silico-manganese steels	9
Chromium steels	5		

It is claimed for this system that it is "capable of unlimited expansion and that no other system could be as simple."

Nevertheless consideration was recently given by the society to revising this system to take care of the rapidly increasing number of alloy steels. It was soon found that in expanding the old code to meet the enlarged requirements, it was necessary to depart from the original plan and to arbitrarily assign symbols to new types of steels without regard to consistency. In other words, it was impossible to adhere to the original method.

The following elements were regarded as being of sufficient metallurgical importance to be considered as possible constituents of alloy steels:

Aluminum	Nickel
Carbon	Silicon
Cobalt	Titanium
Copper	Tungsten
Chromium	Uranium
Manganese	Vanadium
Molybdenum	Zirconium

The method of expansion proposed by the society to take care of the new alloys may be illustrated by the following cases:

Group 1—Carbon steels.

10--Carbon steel as now specified.
10--(plus three figures for carbon contents above 1.00 per cent.)
11--Carbon steel, screw stock.
12--Carbon steel, castings.
13--Carbon steel, with manganese content from 1.00 to 1.50 per cent.
113--12-14 per cent manganese steel.

The figures 14 to 19 are reserved for additional carbon steels.

Group 2—Nickel Steels.

The first figure indicates the nickel group while the second figure represents the per cent of nickel, thus:

21--Nickel steel with 1.00 per cent nickel.
23--Nickel steel with 3.00 per cent nickel.
25--Nickel steel with 5.00 per cent nickel and so on.

The remaining numbers, 26 to 29 inclusive, are reserved for other nickel steels, such as NiV, NiMo, NiMn, NiSi.

Group 3—Nickel-Chrome Steels.

31--Nickel-chrome with 1.00 to 1.50 per cent nickel.
32--Nickel-chrome with 1.50 to 2.00 per cent nickel.
33--Nickel-chrome with 3.00 per cent Ni and 1.50 per cent chrome.
34--Nickel-chrome with 4.00 per cent Ni and 1.50 per cent chrome.

The remaining numbers 35-39, inclusive, are reserved for other nickel-chrome steels such as NiCrV, NiCrMo, NiCrSi, etc.

Group 4—Unassigned.

Group 5—Chrome Steels.

51--Chrome steel as now.
52--Chrome steel with 1.00 to 1.50 per cent Cr.
52--Chrome steel with 3.00 per cent Cr.
54--Chrome-steel with 4.00 per cent Cr.
512--Chrome steel with 12.00 per cent Cr.

The remaining numbers are for other chrome steels such as CrMnSi, CrMo, CrSi.

Group 6—Vanadium and Chrome-Vanadium Steels.

60--Vanadium.
61--Chrome-vanadium as now.
62--Chrome-vanadium with 2.00 per cent Cr.
63--Chrome-vanadium with 3.00 per cent Cr.

The remaining numbers are reserved for other combinations such as CrMoV, CrSiV.

Group 7—Tungsten and Tungsten-Chrome.

70--Tungsten 5.00 per cent W.
71--Tungsten-chrome with 1.00 per cent W.
72--Tungsten-chrome with 2.00 per cent W.
73--Tungsten-chrome with 3.00 per cent W.
74--Tungsten-chrome with 4.00 per cent W.
75--Tungsten-chrome with 5.00 per cent W (Magnet).
713--Tungsten-chrome with 13.00 per cent W.
716--Tungsten-Chrome with 16.00 per cent W.

It was undecided whether to designate the straight 5.00 per cent W. steel as 70 or 75, and whether there would be occasion to classify any other tungsten steel in this group.

No provision has been made to take care of tool steels.

Group 8—Not Assigned.

Group 9—Silicon and Silicon-Manganese Steels.

90--
91--Silicon steel with 1.00 per cent Si.
92--Silicon steel with 2.00 per cent Si.
93--Silicon steel with 3.00 per cent Si.
94--Silicon steel with 4.00 per cent Si.
95--Silicon steel with 5.00 per cent Si.

AUTHORS' SYNOPSIS

The present system of steel classification is believed to be limited in scope, arbitrary rather than scientific and not inherently capable of consistent expansion.

The original simple plan is already outgrown; the proposed further expansion tends to complication. Examples of inconsistencies are shown.

A scientific system capable of unlimited expansion is needed. Symbols should be consistent and should suggest material represented, aiding the memory.

A straight number system is necessarily limited.

A combined letter and number system is suggested, which is mnemonic, simple and truly elastic, and which indicates both materials and their approximate quantities, if desired, without complication.

Illustrations of the proposed system are given.

*Metallurgical engineer, Philadelphia.

The remaining numbers are reserved for the other silicon combinations such as SiCr, SiNi, etc.

In all the above symbols, the dashes represent carbon content.

Limitations of Present S. A. E. System

It is believed that a careful analysis, entirely unprejudiced by the familiarity of usage and custom, would show that the present system of designation of steels by numbers, although it has perhaps been simple, convenient and workable up to the present time, is in reality unscientific, arbitrary and not inherently capable of wide expansion.

The original plan of using the first figure of the designating number to indicate the alloy, the second figure the approximate amount of the alloy and the final two figures the approximate carbon content of the steel was excellent so far as it went, but it has quite evidently been outgrown by the multiplicity of alloying elements and combinations which have come into use.

It is true that an arbitrary assignment of unused numbers may be made to cover the diverse alloys now immediately in view, with some margin for further expansion, but such numbers will necessarily be inconsistent with the fundamental plan of the system and must therefore lead to confusion.

Inconsistencies Illustrated

For example, under Group 2, nickel steels, the first figure, 2, indicates nickel, the second, from 1 to 5, the approximate percentage of nickel, and the third and fourth figures, the carbon content. It is now proposed to use the remaining numbers, 26- -, 27- -, 28- -, and 29- -, for nickel steels containing another alloy, excepting chromium, such as vanadium, molybdenum, manganese, silicon. The original plan is thereby abandoned and confusion is inevitable.

Moreover, is there any reason to feel sure that numbers at present unused will take care of all new or unlisted alloys and combinations of alloys? For instance, 26- -, 27- -, 28- - and 29- - are proposed to take care of four different alloys of nickel. When these are assigned, what about further alloys? And how will varying *quantities* of the alloys be indicated? Are there not several possible proportions of, say, nickel-molybdenum to be distinguished? How will a number such as, say 27- - for the nickel-molybdenum group do this?

To illustrate the inconsistencies which will result from further expansion of the present system, take several steels having an 0.30 per cent carbon content:

2330 = 3.50 per cent nickel.
2630 = say (?) per cent nickel, (?) per cent vanadium.
2730 = say (?) per cent nickel, (?) per cent molybdenum.
3130 = 1 per cent nickel, 0.60 per cent chromium.

Why should the second figure in the first case represent the amount of nickel? In the next two cases the presence, but not the amount of some other element, say vanadium or molybdenum, the amount of nickel being ignored; while in the last case the first figure indicates two elements, nickel and chromium, the second figure the amount of nickel, while the amount of chromium is ignored.

Furthermore, nickel-chrome-vanadium shall be, say, 36- -, which does not indicate the quantity of any alloy, whereas, without the nickel the same steel would be 61- - (chrome-vanadium), or if the chromium were omitted, it might be 26- - (nickel-vanadium). For chrome steels, we have the Group 5, which does not appear in any of the above combinations containing chromium. For tungsten-chrome steel we use 71- -, 72- -, etc., the first figure indicating the presence of tungsten and the second figure the amount, there being nothing to indicate either the presence or amount of chromium.

Many illustrations of such inconsistencies and departures from the original plan could be quoted. It would seem as if the matter might become almost as arbitrary and involved as the Chinese alphabet, if much expanded.

Need of a Universal System

Ten years ago, when the system was adopted, alloys were few. At the present time, the number of alloys and combinations has already outgrown the original simple plan. Is there not reason to believe that new discoveries and experiments may result in even greater expansion in the next 10 years? May it not, therefore, be time to develop a system founded upon a scientific basis, which can be expanded indefinitely to meet present and future needs without becoming arbitrary and complex or introducing exceptions?

Any straight numerical system is necessarily limited. For example, in the present system, the first figure (on the left) is sometimes used to designate one material and sometimes two (as 2- - - for nickel and 3- - - for chrome-nickel), while the second figure sometimes designates the amount of the first material (as 23- - for 3½ per cent nickel), sometimes the amount of the second material (as 32- - for chrome-nickel with 2 per cent nickel), sometimes the amount and presence of the second of two materials (as 63- - for chrome-vanadium, with 3 per cent Cr.), and it is now proposed to have the second figure sometimes designate the presence but not the amount of a third material (as 36- - for nickel-chrome-*vanadium*). Further complications are introduced by using two numbers to designate the amount of certain materials (as 113- - for 12 to 14 per cent manganese steel).

It seems clear, therefore, that by using numerals alone, a system permitting unlimited expansion without inconsistencies is impossible (unless, perhaps, a complicated decimal system running into high numbers were used, analogous to the Dewey decimal system, which is undesirable). One reason for this limitation is that the number of available units, 9, is less than the number of alloying elements, already more than 12.

Characteristics Desired

It is, therefore, worth considering whether a system involving letters may not indeed be developed to meet the requirements. A perfect system should be:

Brief, easy to say, write or print.
Universal, capable of unlimited expansion.
Comprehensive, capable of indicating approximate quantity of each alloy as well as its presence.
Mnemonic, easy to remember.

A letter system has the advantage that there are 24 available units (omitting O and I), as compared to 9 with numbers. A letter is as simple as a number for designating a material, and within certain limitations, the letters can be chosen so as to represent, or at least suggest, the name of the material in question, which a number cannot do. Numerals may then be used solely to indicate the quantities, which is their true function. This comes down to a simplified chemical system. Can such a system be made sufficiently simple to meet the requirements?

Proposed System

As indicated above, there are 14 elements at present recognized as likely to enter into alloy steels. Discovery may result in the use of a number of others. Let us consider the present ones listed in the following table, with a proposed designation for each:

Element	Chemical Symbol	Proposed Alloy Symbol
Aluminum	Al	A
Carbon	C	C
Chromium	Cr	K
Cobalt	Co	B
Copper	Cu	Q
Manganese	Mn	M
Molybdenum	Mo	L
Nickel	Ni	N
Silicon	Si	S
Titanium	Ti	T
Tungsten	W	W
Uranium	Ur	U
Vanadium	Vd	V
Zirconium	Zr	Z

Each of these elements is symbolized by a single and distinctive letter which suggests, in some degree, its name or chemical symbol, so that the system is so far mnemonic.

This leaves 10 letters of the alphabet to take care of other elements whose usefulness is still to be learned. The letters I and O should be omitted

on account of their resemblance to numerals.

This permits of nearly doubling the number of alloying elements now used, before combinations of two letters will be necessary. It is apparent that even should two letters be employed to designate any new element there would be no resulting confusion. This, of course, contemplates the use of capital and small letters for a symbol. The symbol for carbon would not necessarily appear, as will be seen below.

In order to indicate, approximately, the quantity of any alloying element, numbers would be used, as in the present system. The number would be placed after the symbol of the element referred to. When unnecessary to designate the amount of the element, this number could be omitted. The carbon content would be indicated by the figures at the extreme left, the prefix C being implied but not written, except in the case of straight carbon steels.

The letter X may be used to designate special steels, differing slightly from the standard, as in the present S. A. E. system. This would be placed at the end of the symbol, so as not to interfere with the carbon content.

Some illustrative examples of groupings and designations under this proposed system follow:

Carbon Steels

Proposed Symbol	Present Symbol
C10	1010
C20	1020
C95	1095
C125	10125
Etc.	

Nickel Steels ("N" Steels)

Proposed	Present	
20N1	2120	(1% nickel, 0.20% carbon)
20N2	2220	(2% nickel, 0.20% carbon)
35N3	2335	(3.50% nickel, 0.35% carbon)

Nickel-Chrome Steels ("NK" Steels)

Proposed	Present	
20N1K	3120	(1.25% Ni, 0.60% Cr)
30N2K1	3230	(1.75% Ni, 1.10% Cr)
40N3K2	3340	(3.50% Ni, 1.50% Cr)
35N3KX	X3335	(3.00% Ni, 0.80% Cr)

Chrome Steels ("K" Steels)

Proposed	Present	
20K1	5120	(1% Cr, 0.20% C)
30K2	5230	(2% Cr, 0.30% C)
60K12	51260	(12% Cr, 0.60% C)

Vanadium and Chrome-Vanadium Steels ("V" and "KV" Steels)

Proposed	Present	
20V	6020	(Vanadium)
20VK1	6120	(1% chrome)
35VK2	6235	(2% chrome)

Other Combinations

It may be seen that the symbol for any steel may be built up logically from the constituents present, thus:

First figures—carbon content.

Then the letter indicating predominating alloy, followed by a numeral showing its approximate percentage.

Next a letter representing second alloy followed by a numeral indicating its approximate amount, etc.

As in the present S. A. E. system, it is not necessary to indicate the less important elements, such as phosphorus, sulphur, etc. It quite often happens that manufacturers produce valuable steels that do not conform to the analyses set down, more or less arbitrarily, by the S. A. E. An undue multiplicity of alloy steels is to be avoided in the interest of standardization; nevertheless, a truly elastic code system should be such that any new alloy steel which has proved its usefulness may be symbolized easily and without confusion.

For example, take a steel of the following composition belonging to the chrome-nickel-molybdenum group:

Carbon—0.25–0.35 per cent
Chrome—0.70–1.00 per cent
Nickel—2.75–3.25 per cent
Molybdenum—0.30–0.50 per cent

In the proposed system, this would be symbolized as follows:

3ON3K1L4

In the present system, there is no way of indicating the quantities of alloying elements, and should a number be assigned it would be purely arbitrary. This is but one example of how difficult it will be, by the S. A. E. system, to classify many of the new alloy steels which have demonstrated their value during the last few years.

A few more illustrations of the application of the proposed system to some new steels follow:

Nickel-vanadium ("NV") steel, - - N - V -.
Nickel-manganese ("NM") steel, - - N - M -.
Nickel-molybdenum ("NL") steel, - - N - L -.
Nickel-chrome-vanadium ("NKV") steel, - - N - K - V -.
Nickel-chrome-molybdenum ("NKL") steel, - - N - K - L -.
Chrome-manganese-silicon ("KMS") steel, - - K - M - S -.

In the above, the dashes would be replaced by the numerals representing the approximate amounts of the elements, the first two numerals indicating carbon content. In case it were desired to show fractional percentages of any element, this could be done by introducing decimal points, thus 3.50 per cent nickel steel of 0.35 carbon would be written: 35N3.5.

It is evident that this system is perfectly elastic, any combination of alloys can be indicated, the quantities of each element can be signified without confusion, if desired, and the symbols are easy to remember.

The authors do not consider that this plan is by any means perfect and feel that the subject should receive very careful consideration from many angles before a new system of symbols is adopted. It seems that a combination of letters and numerals will provide the simplest form of symbol in the end and that, in fact, such a combination is essential in order to make the system truly expansible and at the same time give the information desired in the briefest form.

It is entirely possible that this system could be adapted to the important field of non-ferrous alloys, but this is beyond the scope of the present paper.

The fundamental principles of the plan may be recapitulated as follows:

Letters represent alloying element.

Numbers represent quantity of alloying element.

The number shall immediately follow the letter indicating the element to which it refers.

Single letters shall be used to represent all the most important alloying elements. (24 different letters are available for this purpose, omitting I and O, because of their similarity to numerals.) For the less important elements, a capital and small letter may be used.

The letters to be chosen to suggest the name or the chemical symbol as consistently as possible, at least for the most important metals.

Numbers, indicating quantity, may be approximate, or may be accurately expressed in several figures, if desired, without confusion.

Carbon content to be placed at the beginning of the symbol, rather than at the end as in the present system.

The number of figures (letters and numerals) in any symbol will depend upon the number of alloys present in sufficient quantities to warrant attention and upon the degree of accuracy to which it is desired to indicate the quantity of each element. It would be impractical to have the same number of figures in each symbol. The letter representing alloying elements should be arranged in order of the importance of the alloy.

It is not claimed that this plan is a final solution of the problem. It is offered in the way of constructive effort, in the hope that it will stimulate interest and discussion which, we trust, will lead to the development of a truly scientific, comprehensive and practical method of classification.

Hot metal will be transferred direct from the new blast furnace of the Trumbull-Cliffs Furnace Co. at Warren, Ohio, to the open-hearth furnaces of the Trumbull Steel Co., located on the opposite side of the Mahoning river. A bridge has been erected for conveyance of the metal direct. Officials state that no date has yet been set for starting the furnace, though ore piles are being built up. Construction of by-product coke ovens is the next step in the development at the Trumbull company's property.

The Link-Belt Co., Chicago, announces a reduction of 10 per cent in the selling prices of malleable iron and steel chains, sprockets, buckets and other products.

WAGE PROBLEMS

Some Steel Companies May Make Further Reductions Plants Losing Money

YOUNGSTOWN, OHIO, Aug. 30.—While advices are to the effect that a number of Eastern independent steel interests are preparing to reduce wages, following action by the Steel Corporation effective Aug. 29, independents in the Mahoning and Shenango Valleys are planning no further curtailments in this respect at present.

"We are losing money at present steel prices and will probably lose more money if we enlarge production," states the president of an important Valley producer. "The actual cost of manufacturing the steel which is sold to-day is higher than the selling price.

"We dislike to reduce wages and will not do so unless compelled to, but the situation is such that labor cost is the only element in current production costs which we control. We cannot expect a further reduction in the price of coal as long as miners are paid high wages. The miners refuse to talk about wages until their contract expires next spring.

"We cannot expect reduction in assembling charges of raw materials, because wages of railroad workers have not been reduced in proportion to the wage rates paid in the steel industry, and railroads as a consequence cannot sell transportation at reduced prices. Our stockholders are taking a loss now. We cannot expect them to take even larger losses, if we keep on operating.

"On the other hand, we cannot afford to shut down our plants entirely. We have a regular list of customers who gave us their business in good times, when we made a profit in dealing with them. We cannot now disregard them, but must fill their orders even at a loss to our company. We cannot disrupt our sales and operating organizations, though we have cut them to the bone and have simply skeleton organizations left.

"We thought that conditions would turn for the better in the fall, but readjustment is slower than we expected. While steel prices have tumbled next to farm products, other industries have not kept pace and we will have to mark time until conditions become equalized."

For the Real Open Shop

At a meeting of the Locomotive Crane Manufacturers' Association, held recently in Cleveland, resolutions were adopted opposing anything that interferes with freedom of contracts of employment and favoring "the real open shop, in which every worker's chance is as good as every other worker's chance, and from which no worker is shut out because he holds a union card and from which no worker is shut out because he has no union card."

Rainey Employees Strike

UNIONTOWN, PA., Aug. 29.—Dissatisfaction over wage reductions at W. J. Rainey, Inc., plants, reported in THE IRON AGE last week, spread during the week just closed with the result that five of the leading plants of the company were forced to suspend operations. Mt. Braddock, Allison, Royal, Revere and Elm Grove plants are closed to-day. Paull plant was closed Aug. 26, when men refused to go to work. A few, however, reported back, and there are some indications that the plants may all resume work next week.

After closing of Mt. Braddock and Allison, employees there prevailed upon the employees at the other plants to walk out. Large groups of the workers marched to the plants yet in operation during the early hours of the mornings and called the workers out of beds for meetings, resulting in their walking out in sympathy. In one instance, when a large group were marching to Paull, sheriff's deputies dispersed the men. Aside from this incident there has been no disorder of moment.

The men, in presenting their claims to their superintendents, demand retention of the Frick scale, lower commodity prices in company stores and a few changes in working conditions. In all 2500 men have been affected as a result of the walkout.

Inquiries for furnace coke are stronger this week than at any other time during the depression. Prices below $3 have been eliminated.

Cable Company Awaits Wage Reduction

ST. LOUIS, Aug. 30.—The Standard Underground Cable Co., Pittsburgh, will not start construction of its plant in St. Louis until the building mechanics recede from the present high scale of labor effective here of $1.25 an hour, which was practically the highest peak reached during the war period. The company, however, will go ahead with the grading of the site, which occupies approximately 600,000 ft. of ground, and the installation of spur tracks. The building will be approximately 320 x 520 ft., and the investment for grounds and buildings will represent $1,000,000.

This announcement was made by R. D. Sangster, industrial commissioner for the St. Louis Chamber of Commerce.

In the Field of Labor

Announcement has been made at the Lynn and Pittsfield plants of the General Electric Co. that, effective Nov. 1, the pay of all salaried employees will be reduced 10 per cent. The cut will apply to salaried officers as well.

Effective Aug. 29, wages of approximately 5000 employees of the American Steel & Wire Co., Worcester, Mass., were reduced 20 per cent, making a total reduction of 36 per cent within a few months. In addition, overtime pay has been abolished.

An application for an injunction against members of the Amalgamated Association of Iron, Steel and Tin Workers to restrain them from picketing the Belmont mill and interfering with the men working at the company's plant recently was filed by the Wheeling Steel & Iron Co., in the circuit court of Wheeling. The application will be heard on Monday morning, Sept. 5. The petitioners charge that the members of the Amalgamated Association are out on strike and are interfering with men employed at the mills.

Owing to irregularity of employment and unemployment in the steel mills at Youngstown, Ohio, the Spanish colony there has dwindled from 3000 to 700 men. Many of the Spaniards have migrated to other sections of the country.

The receiver for the United (Street) Railways, St. Louis, has announced a cut of more than 15 per cent in the wages of between 400 and 500 employees of their general repair shops. The reduction is due to general business depression and closing down of manufacturing establishments, which caused a heavy falling off in street railway travel. The cut is effective Sept. 1. The men entered a protest and negotiations have been started.

Railroad Conditions Improving

For the first time this year, total shipments of freight exceeded 800,000 carloads, when in the week ended Aug. 13 the number reached 808,000, says the *Railway Age*. This was substantially less than the railroad freight movement for the same weeks in 1920 and 1919, but reflected the slow but steady improvement in the railroad situation which is taking place. Railroad net earnings are increasing as business improves and expenses are brought under better control, and the July reports, when available, undoubtedly will make much the best showing this year.

The American Bosch Magneto Corporation, Springfield, Mass., has received a contract for starting, lighting and ignition systems from the Hudson and Essex automobile makers involving better than $1,250,000, deliveries to extend over a period of months. A large percentage of the work will be done at the Gray & Davis, Cambridge, Mass., plant subsidiary.

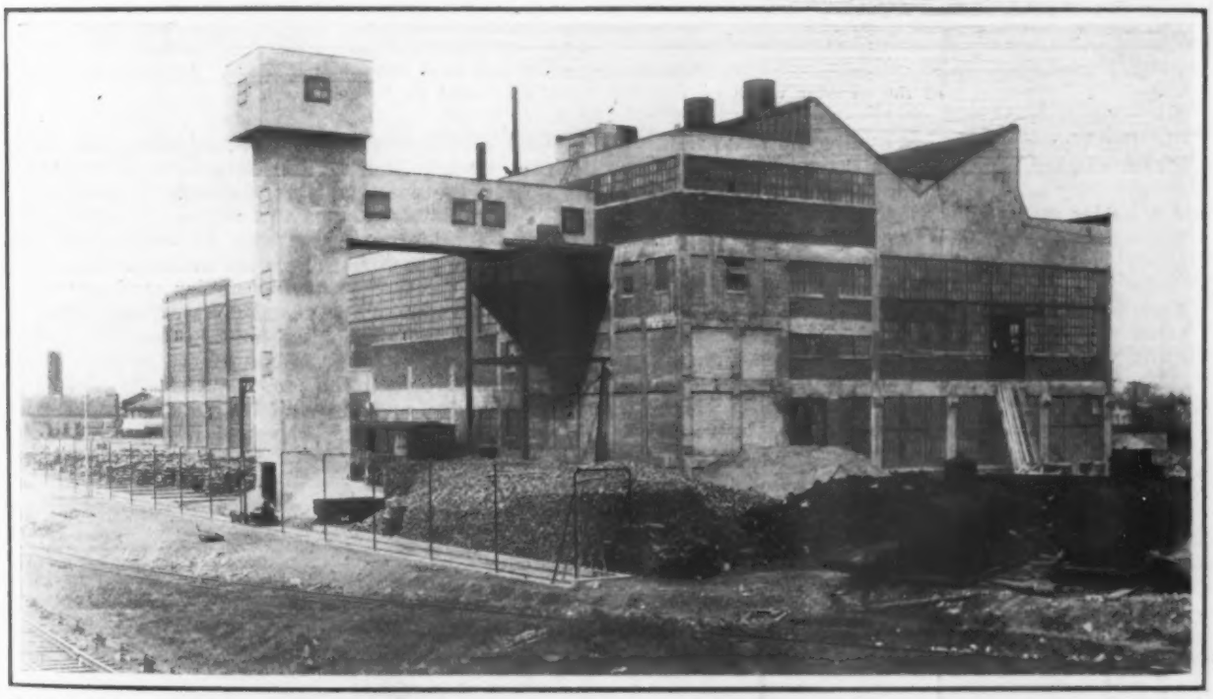
Continuous Foundry for Pipe Fittings

Designed for Minimum Handling of Sand, Castings, Cores, Hot Metal and Flasks —Novel Layout and Modern Details

BY HENRY M. LANE*

ORIGINALLY the castings for the General Fire Extinguisher Co. were made by the Carpenter Foundry Co. in Providence, R. I. When, later, the Carpenter interests were taken over, a new foundry plant built at Auburn, a suburb of Providence, was a pioneer in many features in the production of this type of castings. The Auburn foundry is a two-story structure, with three stories over part of the ground, the castings being made on the upper floor and passed to the lower floor for transportation to the cleaning room.

Recently the company has built, at Warren, Ohio, a large new plant in which advantage was taken of experience gained in the old plant, and information resulting from careful studies of the general foundry field. At Warren had been maintained for many years a pipe-cutting and assembly plant; the machine shop has now been extended to include pipe tapping, and a complete foundry has been built for producing all sizes of pipe fittings up to approximately 8 in. Heavy pipe fittings are practically all produced in the company's Southern plant, at Atlanta, Ga.



Incoming Coke and Metal Are Unloaded in the Yard at Left. All melting stock passes up the elevator tower in foreground, then across the bridge, and so reaches the cupolas, the stacks of which show above the roof. Sand bins are in the corner of the building, back of the blank walls

Like the Auburn plant, the new Warren plant is a two-story structure, but it has a number of new features in storage and handling. The incoming freight track runs alongside the building, and pig iron is unloaded from the cars into piles away from the building. Coke is unloaded into a big pit depressed below the general yard level, but at the time our picture was taken an additional supply had been piled above the yard level.

Incoming sand, dumped into a hopper under the track, is taken up by mechanical means and stored in sand bins. The material for melting stock is handled from the pig iron and stock yard onto a transfer car, electrically operated, which runs the length of the yard. Cars going to the charging floor are brought by this transfer track to the elevator shaft, taken up the elevator and across the bridge onto the charging floor. Under this bridge is the refuse bin, into which all such refuse as material from the cupola drop, burned sand and ashes are dumped. From this they can be dumped directly into outgoing cars.

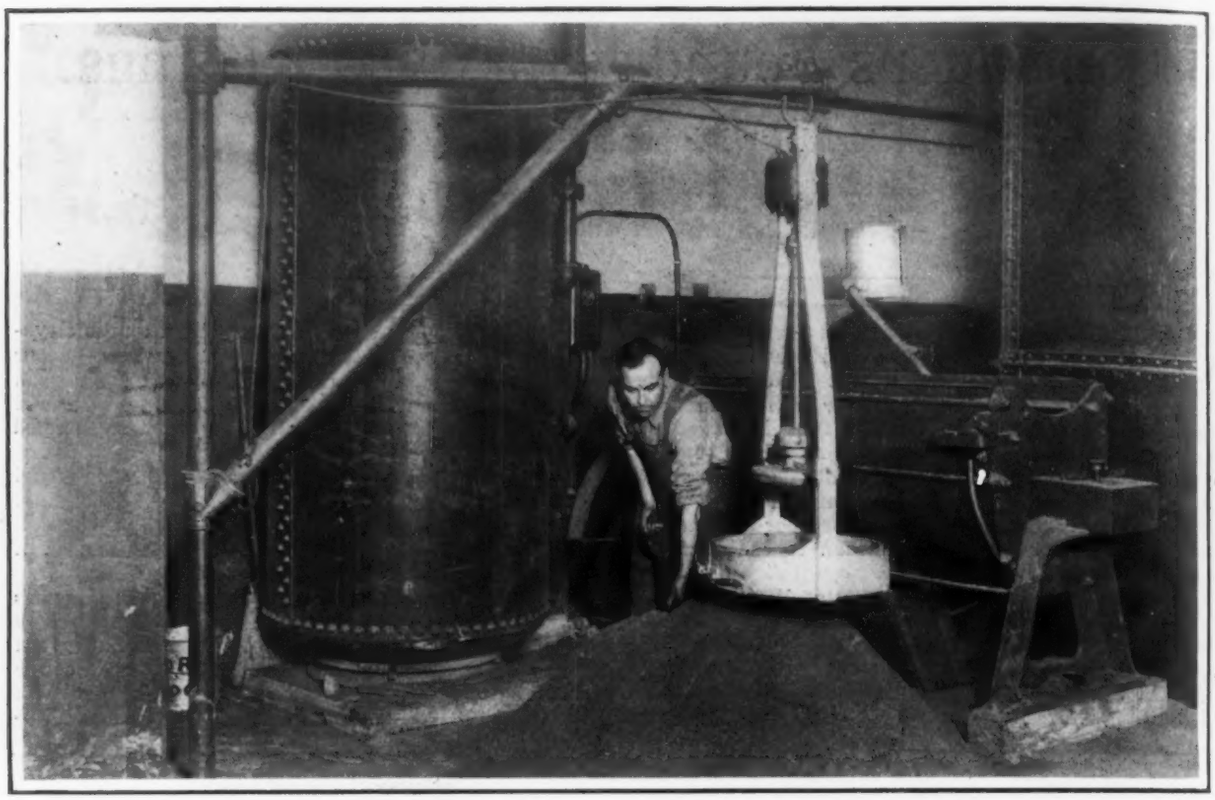
The charging platform is on a level which would be really the fourth floor of the foundry building. Under the platform is a compact concrete structure, shown at the right of the bin, which consists of a series of sand bins nearly 40 ft. deep.

Above these bins is a belt system; the sand comes up an elevator and is transported over the bins by means of the belting, and scraped off into any given bin by plows, one of which is shown near the head of the belt. These plows can be lifted out of the way so that only one is in operation at a time. The bins are like grain elevators or silos and give a considerable depth of sand in storage, so that the number of tons on a given floor area is rather surprising. Sand is taken out from the bottom of these bins and transported by the monorail, for blending with the old sand in the molding sand equipment, or wheeled to the core sand mixer.

Only a few feet from these bins is the core sand mixer. Any sand which requires riddling before mixing is put through a gyratory riddle, which swings on the small crane shown. The mix is then bedded down so as to get the various ingredients thoroughly blended before they are shoveled into the mixer.

At this point the fact may be noted that the company is a pioneer in a good many things in the core line. At the Providence plant many years ago a core mixture was worked out which contains no oil, and this type of mixture has been used successfully ever since. The secret of its success, however, is largely due to the fact that in a continuous foundry a water soluble binder may be used, for the cores do not remain in the mold long enough to draw dampness.

*President H. M. Lane Co., Detroit.



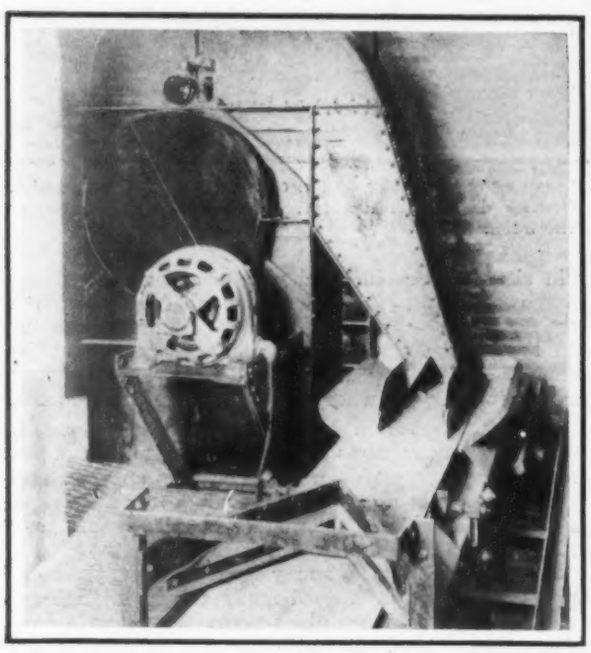
Core Sand Mixing Equipment Includes a Gyratory Sand Sifter for Riddling Sand and a Batch Mixer. At rear is the casing of the elevator which conveys the mixed core sand to the core room

In the Warren plant essentially the same mixture has been adopted, composed of a sharp or lake sand like Michigan City sand, a certain amount of molding sand and a binder made from waste liquor refuse from the sulphite paper process. After a mixture is made it is dropped directly from the bottom of the mixer through a chute into the elevator and passes up to the sand storage bins over the coreroom.

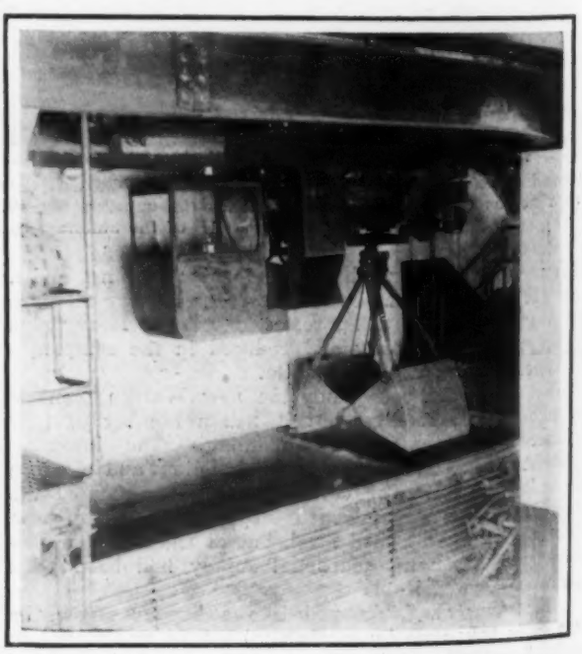
One view shows the Holcroft & Co. core ovens on the left, with some of the core racks on the right. The three rack-type ovens and three drawer-type ovens are all fired from one firebox on the first floor. Doors in a partition in the background lead to the coreroom proper. The core sand, discharged from the elevator into any one of several bins by a swinging spout, is then distributed by means of an overhead gallery and dumped directly into bins back of the coremakers' benches, or into bins for the Demmler core machines.

Behind the core racks at the right is a partition which immediately adjoins the molding floor; through windows in this partition boxes of cores are passed directly from the coreroom to the molders. The work is so arranged that practically all dry sand core work is located on this side of the foundry. These windows are shown in the view of the foundry floor.

Another view shows the end of the series of coremakers' benches, with the sand spouts leading from the platform above, and also the Demmler machines used in making a very large proportion of the cores. The Demmlers were located at the end of the room next to the core ovens so that there would be a minimum amount of handling of the unbaked cores.



Sand Comes Up the Elevator, of Which the Head Is Shown, and Is Distributed by the Conveying Belt Running Over the Sand Bins. The plow in foreground can be located where desired



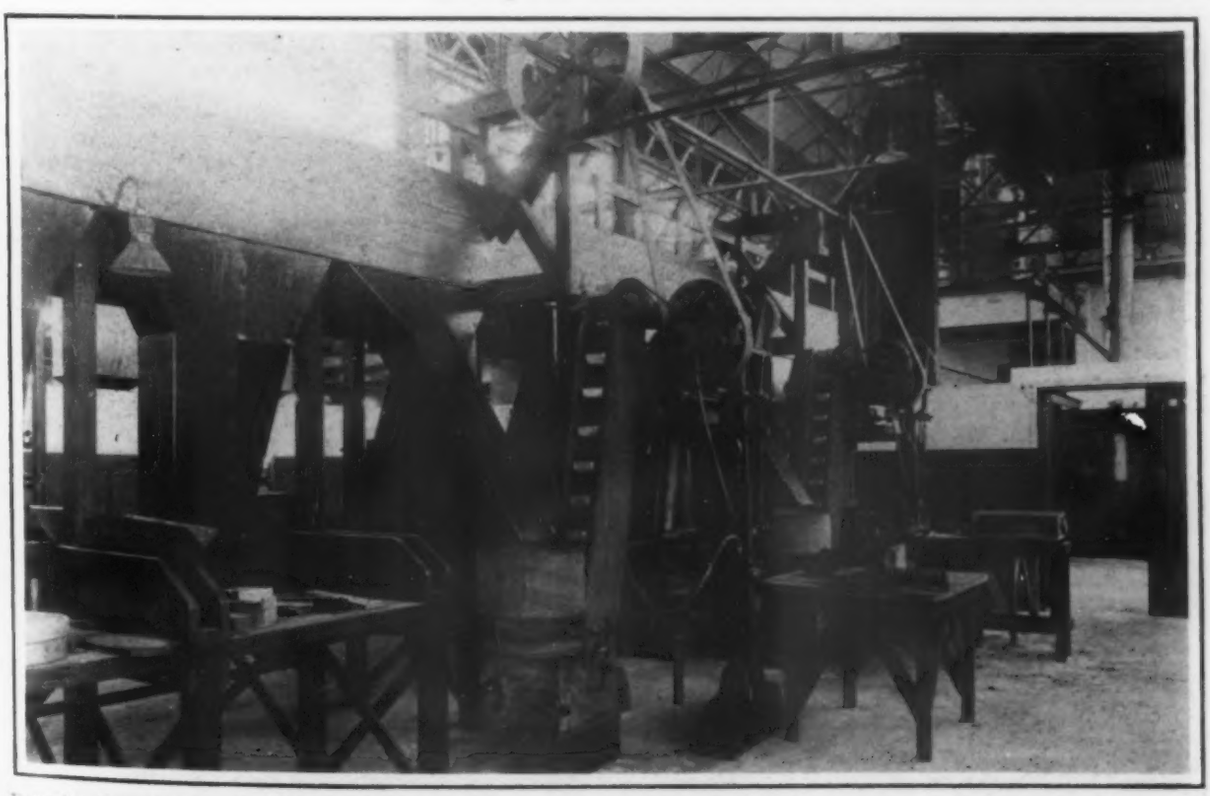
Sand Is Delivered to the Sand-Mixing System by a Monorail Grab Bucket, Which Removes the Sand from the Long Bin at Left, Where It Is Deposited After Being Shaken Out of the Used Molds

Core Ovens at Left and Racks at Right. Windows in the wall behind the racks permit passing of baked cores to the molding floor beyond. Core room is behind the double doors

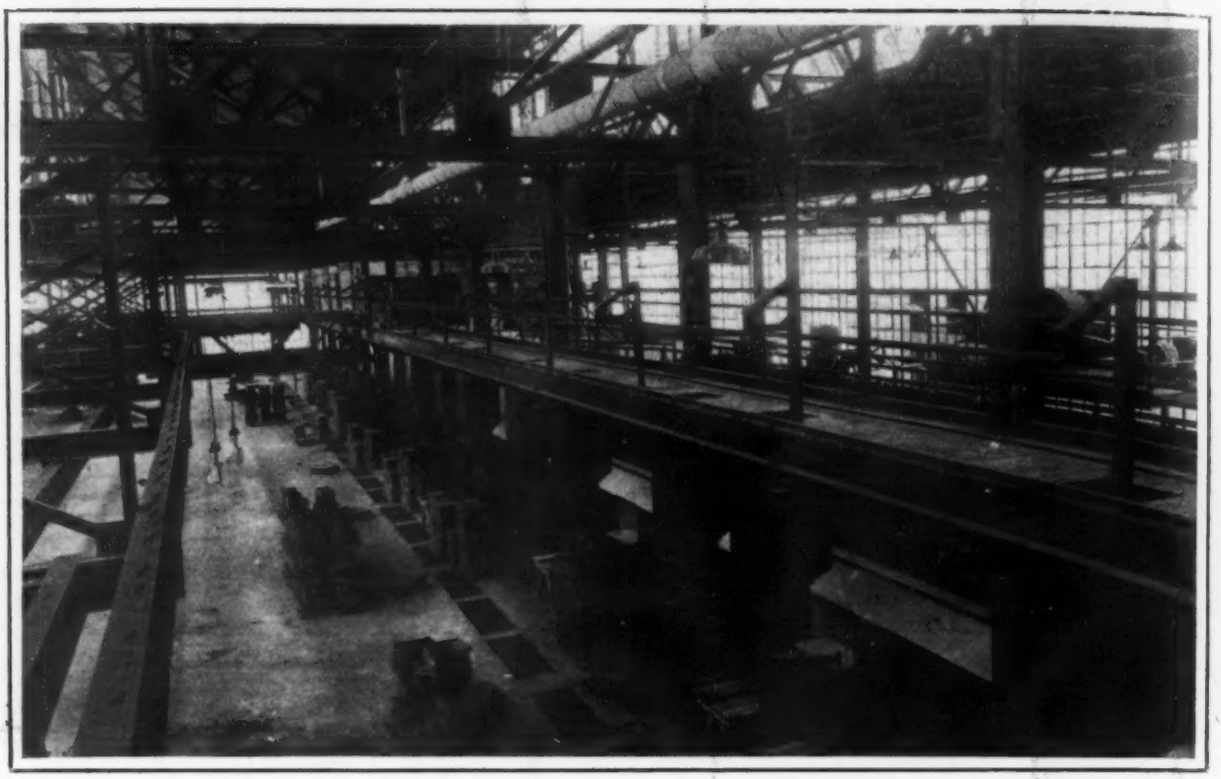
Both sides of the molding floor are served by sand bins, but of slightly different type. In the general view of the molding floor are shown the undercut-gate bins which drop the sand directly into the molds. On this side of the shop is a continuous line of Nicholls molding machines. These are all jar ramming machines, and they are arranged with a cushion foundation, so that the vibration on the molding floor is reduced to a minimum. This illustration also clearly shows the windows back of each machine, through which cores are passed from the coreroom to the molding floor.

Tempered molding sand is taken in a car down the gallery over the molding machines and dumped directly into the bins. In front of the molding machines is an almost continuous dump-out grating, through which molding sand is dumped to the floor below, and at intervals are located casting chutes, through which the castings are sent down.

In practice, the molders set out a group of molds at one side of the floor, and the pouring gang then comes along and pours these while a group of molds is being put up on the opposite side of the floor. The first group is poured and shaken out and the flasks stacked back before the second group is completed. At the Auburn plant they have been able to utilize the floor



Demmler Core Machines Fitted Up for Making a Large Variety of General Fittings Cores. At left is beginning of a series of core-making benches for hand work. Sand from the elevated platform supplies both benches and machines



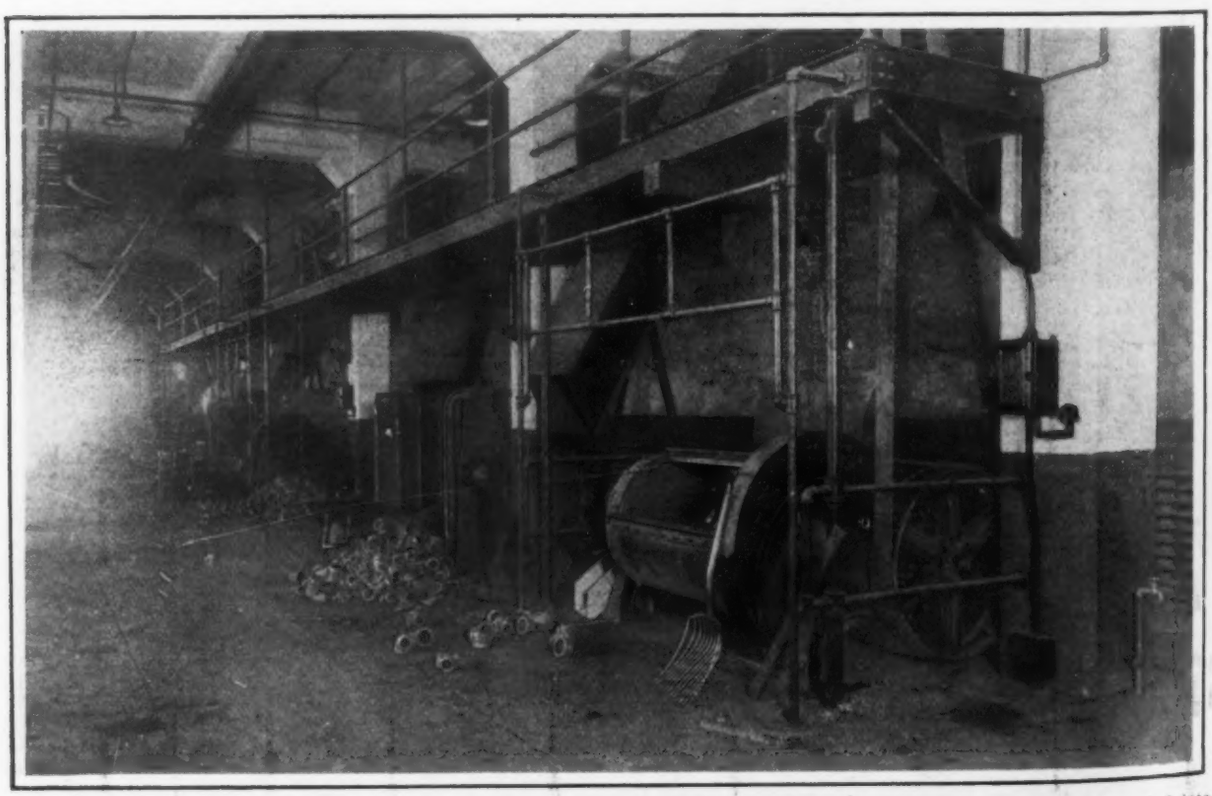
This Molding Bay Running Down the Center of the Building Is Supplemented by Another at the Left. Sand is distributed from the gallery at right. Core room is beyond the wall at right. Pouring cranes span each molding bay

from four to seven times, depending upon the type of work, and this in turn minimizes the distance that a molder must carry his molds to set them out. It also conserves floor space, and consequently investment in the plant.

Over the molding floor are a series of underslung cranes with Brillion pouring devices, so that the pouring gang can pour off without the use of hand ladles. The metal is distributed down the gangway in the center by means of a monorail.

On the opposite side of the foundry, part of the distance is taken up by a group of Nicholls machines and part by a group of larger Osborn machines. At the end of the plant next to the molding unit are located several large Osborn machines for making fairly heavy fittings.

Both castings and sand pass through the floor to the lower level, the sand landing in two long bins back of the casting chutes. Over these bins runs a monorail with a Sprague Electric Co. carrier and Blaw-Knox grab bucket, which carries the sand from the sand chutes to a bin at the end of the plant, under which a pan feeder feeds it through suitable mixing machinery in the basement under this part of the plant, where any core butts or scrap are riddled out. Sand from here passes up through an elevator to the top of the



Tumbling Barrels and Chutes for Delivering Castings. After being run through the tumblers, the castings are sorted into boxes and taken to the grinding room, behind the partition at right

Castings Are Brought from the Tumbling Department into the Grinding Room in Wooden Boxes Mounted on Stands Provided with Wheels. After grinding, they go into the barrels and are taken to the tapping room

sand towers, where it is tempered on a moving belt by adding sufficient water as it passes through a series of rakes and plows. It is then dropped through a Sellers centrifugal mixer and lands in a big bin over the sand galleries, from which it is fed by a pan feeder into cars for delivery back to the molders. The sand storage bins below and above are of sufficient capacity to hold sand equal to about six hours of molding, so that it is not necessary to have the grab bucket in constant operation.

One feature of this plant is the reduction of the handling distance to a minimum, by placing the tumbling barrels adjacent to the ends of the casting chutes. The series of casting chutes and the Sly tumbling barrels on the first floor are interspersed. Behind these tumbling barrels is located the long sand bin above referred to, and in front of them a monorail system for carrying castings to the grinding room.

The grinding room is located under the coreroom, the general view showing a series of Norton grinding wheels and sorting benches. More barrels are in view than would ordinarily be the case. In practice, the castings ready for grinding are brought in in the boxes, a few of which can be seen. These boxes are on wheels

Metal and Coke Brought to the Charging Platform in Cars Which Serve as Stock Bins Are Loaded in Charges onto the Small Cars Shown, Which Are Then Wheeled Over to the Cupolas for Use. All charges pass over the scale platform and are recorded

and are shoved up next to the grinding stand. As the grinding is done the finished castings are thrown into the barrels for transportation to the tapping shop.

Ingersoll-Rand Co. air-compressor and motor-generator sets necessary for the plant are located in a room on the first floor adjacent to the core sand mixing unit.

In the general view of the charging floor, the Kron scale at the left is located at the end of the bridge from the elevator in the yard. At the time this picture was taken the final charging system was not fully worked out. In practice, various grades of pig iron are brought from the yard on cars, in bulk, each car carrying from one to two tons of a given grade. On reaching the charging platform, the cars are used as stock piles from which the several charges are made up. The scrap likewise comes in cars. The charges are made up on small flat-wheeled cars on the scale, the material for each mixture being taken from the cars carrying the material in bulk, which are located around the scale. As soon as the charge is made up, the small car is shoved over near the cupola, and as several charges are made up ahead, the cupola never has to wait.

There is sufficient space on the charging platform for the storage of metal sufficient for two or more days' run, so that in case of bad weather it will not be necessary to bring in material from the yard. As the metal is kept in the cars, there is no labor used in unloading onto the charging platform. Attention is called to the fact that this charging platform is open to the main foundry structure, so that the heat from the stacks ascends directly into the monitor of the Pond roof and gives immediate ventilation to the charging floor.

Three Otis platform elevators of the micro-drive type are used in connection with this plant. One is in the tower of the yard, for bringing up pig iron and foreign scrap, and this runs below the general yard level, to the bottom of the depressed coke storage yard, to get coke. Adjacent to the charging platform is an elevator used for bringing up returned scrap to the charging floor level and also to handle rubbish into the rubbish bins. At the opposite end of the plant is an elevator for handling patterns, arbors, flasks, etc., from storage to the pattern-shop or to the foundry, and for handling general supplies to the stockroom, and serving the various floor levels at the end of the building.

Up to the foundry level the structure is of solid concrete of the beam type, and so designed as to reduce vibration from the molding machines to a minimum. Above the foundry floor level is a steel structure, with a Pond type roof over the foundry, and a flat roof over the service building, which houses the offices, pattern storage, a completely equipped pattern-shop, washrooms, shipping room and various other necessary adjuncts to a continuous foundry.

Two Whiting No. 7 cupolas are installed with 72-in. shells, provided with double linings to reduce the diameters. These cupolas are planned to melt about 30 tons per day. At present they are used on alternate days. Continuous pouring is to be the rule, either using one cupola in the morning and the other in the afternoon, or, after using one throughout the morning, blanking it with coke and blocking the tuyeres until time to start it up again in the afternoon. So far they have not started continuous melting, but are making a rather long heat each afternoon.

As screen type charging doors are found to last longer than the brick-lined type, the former are fitted. The cupola legs are on the level of the molding floor, and the drop falls through that floor into a room below, where it is quenched and then put through a Sly water-barrel to recover any iron or coke it may contain. The Roots blowers are mounted on a mezzanine floor immediately over the charging floor.

It will not be necessary to install a third cupola, for which the plant was designed, until the daily melt reaches 60 tons. That figure is the limit of the present cupolas, and is beyond the demand of the molding plant as now installed, but gradual extension will, it is anticipated, bring the capacity to that figure at no distant date.

The general contractors were the Foundation Co., the plumbing contractors the Stamberger Co. and the electrical contractors the Livingston Co. The sand handling equipment was designed by the engineers, the H. M. Lane Co., Detroit, who designed and laid out the entire plant. The sand handling machinery was furnished by the Lamson Co. Sash was furnished by David Lupton's Sons Co. The heating and sprinkling systems were installed by the owner.

LOWER EXPORT RATES

Interstate Commerce Commission Grants Petition of Eastern Railroads

WASHINGTON, Aug. 30.—In an effort to place the iron and steel industry of the country in a position to compete for business in foreign markets, the Interstate Commerce Commission last Thursday authorized the railroads east of the Mississippi river to re-establish export rates on iron and steel on five days' notice. These rates are slightly more than 20 per cent less than the rates now in effect. Applications for authority to re-establish export rates lower than the domestic rates were filed for the Central Freight Association lines by one agent. The Eastern lines acted individually. The applications were received and acted upon the same day. They are to become effective Thursday of the present week.

The railroads acted upon the representations made to them by the iron and steel industry about 15 days ago. They repeated to the commission the arguments made to them by the iron and steel makers, chief of which was that the industry is faced now by the conditions that confronted it in pre-war days. That is to say, the European nations that were devoting all their energies to the making of war have taken up their peace time efforts in commercial lines and Americans, to meet them in the common foreign markets, must have the benefit of rates to the ports lower than those given upon domestic business.

At the time of the conference in New York, the railroad traffic executives said that, in their opinion, iron and steel was not being held up by the freight rates to the ports but rather by the inability of foreign purchasers to finance orders they might be inclined to give to American producers. The railroad interests said they were inclined, however, to try the experiment of restoring export rates from 20 to 25 per cent less than the domestic rates, which now, almost without exception, are the full fifth class basis.

Under the tariffs, the rate on manufactured iron and steel from Chicago to New York will be 47.5c. instead of 63c., and the rate from Pittsburgh to New York will be 28.5c. The rate applicable on both export and domestic at present is 38c.

Export rates on iron and steel were abolished before the United States entered the war because Europe was clamoring so persistently for iron and steel from American mills that there was no commercial necessity for the railroads making any concession to the sellers. The latter were without competition. All iron and steel was under control of the governments at war and the neutrals were given only such as the warring nations had to give up in exchange for foodstuffs.

The disappearance of that control and the fact that the nations that were at war have devoted the output of their steel mills to purposes other than war, constituted the chief reasons for the restoration of export rates.

These tariffs, according to their terms, will expire Sept. 1, 1922. The filing agents made their preparations for the restoration of export rates with a view to having them become effective Sept. 1, so that the export rates, when filed will be intended to apply for one year at least. The chances are that they will remain indefinitely and tend to go lower.

Bids will be opened Oct. 19 at the office of the Obras Sanitarias de la Nacion, Buenos Aires, Argentine Republic, for 7000 tons of cast-iron pipe.

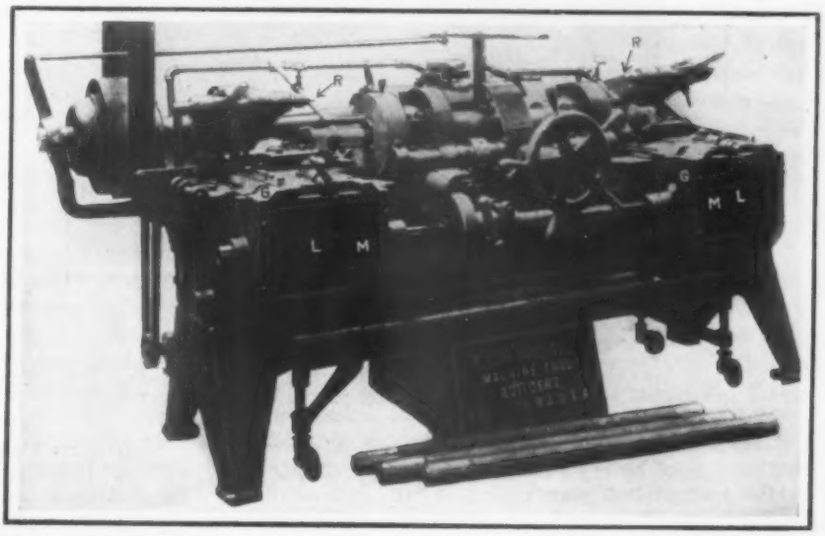
Axle Shaft Turning Machine

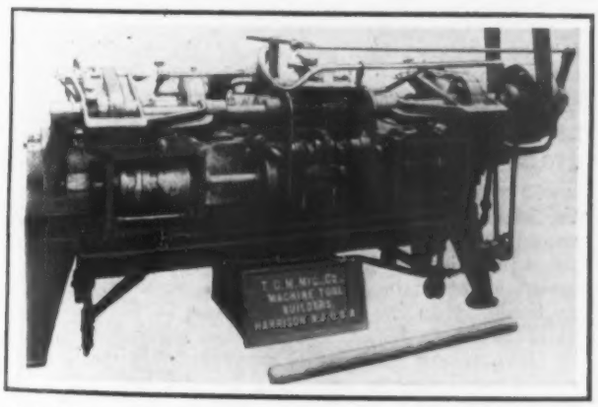
An interesting development in special purpose machinery is represented by the semi-automatic turning machine recently designed and built by the T. M. C. Mfg. Co., Harrison, N. J., for the Timken-Detroit Axle Co. The machine is shown in the accompanying illustrations and is used for machining automobile and truck axles of the "full floating" type.

The shafts machined are of nickel or chrome nickel steel, the forgings being formed either by upsetting the ends of rolled bars in a bulldozer, or by the Baehr continuous die rolling process, operated by the Witherow Steel Co., Pittsburgh. The forgings are heat treated before machining. The machine takes the forgings, as shown on the line drawing, and squares the ends to length; turns down each end to the correct diameter; forms the bevel at one end and the check at the other. Each end is centered true before the shaft is removed from the machine, the centering being necessary for the further operations of finish grinding the diameter of the ends and hobbing of the splines required on the large diameters.

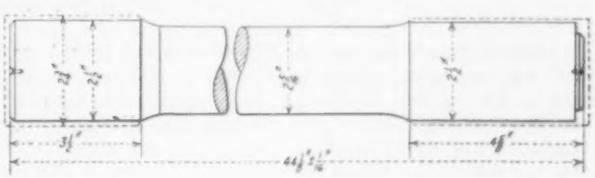
The forging to be machined is placed in the hollow spindle of the machine, leaving both ends projecting. It is held by two scroll chucks close to the portions to be turned and is located by a positioning stop which is brought up to place by a lever. The stop when not in use folds down out of the way. The chucks are operated together by the hand wheel acting through a differential which allows of the chucks being brought down equally tight on each end of the shaft irrespective of any variation in diameter of the bar under the two sets of jaws. There are four slides, the first pair carrying the tools which turn the diameters; the second pair face the ends to length and put in the check and bevel edges. Slides G and H (indicated in the illustration) make two and three movements across the work respectively during each cycle of the machine, the tools being advanced the amount of the cut to be taken before each passage of the tool is begun. The slides G are moved along the bed by cams L, which engage with cam rollers in the bed, each slide carrying a cross slide, K, controlled by cams M. Variations of diameter are taken care of by screw adjustments on each cross slide.

When the forging is clamped in position a trip lever starts the cam-operating shafts and the four tools move simultaneously over the work. When the cycle is completed the tools come to rest clear of the shaft. The operator then swings down the center drilling spindles, R, and sinks the centers, the shaft revolving meanwhile. The finished shaft is then ejected by an extension of the positioning bar which pushes the shaft far enough out of the chucks to be lifted out. A gear box provides three spindle speeds and three feed speeds to take care of various diameter shafts. The hollow main spindle is made telescopic and the slides at one end of the machine are adjustable to accommodate shafts of from 36 to 48 in. and diameters from 1¾ to 2¾ in. The drive is by a single belt and clutch pulley. The cutting tools are either circular formed tools or may be solid rectangular tools as desired. The time per shaft varies from 4 to 10 min. according to the diameter and cutting quality of the heat treated forgings.





Axle Forgings of the Dimensions Shown in the Line Cut Below Are Placed in the Machine Which Squares the Ends to Length; Turns Down Each End to Correct Diameter; Forms the Bevel at One End and the Check at the Other. The slides and cams and the center drilling spindles are indicated by letters in the view above. The rear view, at the left, shows further details of the slides and the arrangement of the gear box



Ore, Coke and Plate Rate Declared Unjust

WASHINGTON, Aug. 30.—A finding of undue prejudice, with an order to remove it before Dec. 1, has been made by the Interstate Commerce Commission in the case of the United Iron Works, Inc., against the Atchison, Topeka & Santa Fe and other railroads. The holding of the commission was that the railroads unduly prejudiced Iola and Independence, Kan., as to rate on iron ore, coke and steel plates. Specifically the finding was that none of the rates under attack by the complainant, which has plants at Iola, Independence and Pittsburg, Kan., and Joplin, Springfield and Aurora, Mo., for the manufacture of machinery of various kinds was unreasonable but unduly prejudicial to Iola and Independence to the extent that the rates to Iola on pig iron, coke and iron and steel plates from Chicago, and pig iron from Duluth, exceeded or may exceed the rates to Girard, Kan., a more distant point; and to Independence to the extent that they exceeded or may exceed by more than 30c. on coke from Chicago and by the same amount per gross ton on pig iron from Chicago and Duluth the rates contemporaneously maintained to Girard.

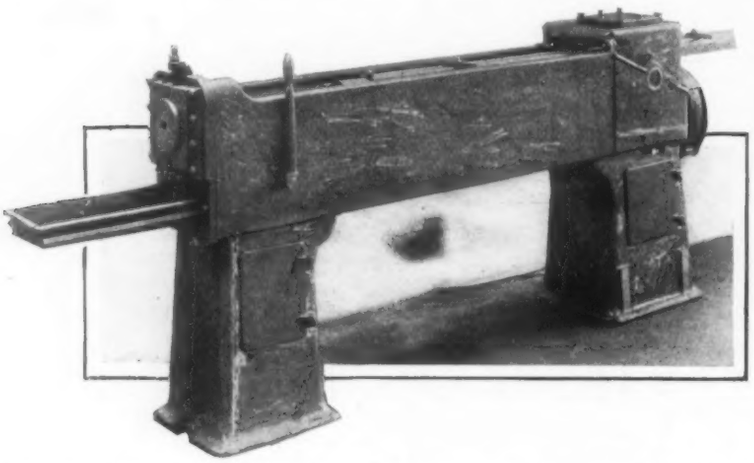
In a fourth section order, the commission denied relief on shipments of pig iron and coke from Chicago and Duluth to Girard, Kan., and directed the carriers to line up their rates, in conformity with the decision on the formal complaint, not later than Dec. 1.

The Macdonald Wire Goods Co., Drummondville, Quebec, Canada, is in the market for over 1,000,000 ft. of No. 12 and No. 6 galvanized wire cloth.

New Heavy-Duty Broaching Machine

A heavy-duty broaching machine having a cutting stroke of 15 ft. per min., and a return stroke of 55 ft. per min., is being placed on the market by the Velco Mfg. Co., Greenfield, Mass.

In this machine the broach holder is attached to a solid steel head which is supported throughout its travel by bronze-gibbed bearings sliding on steel ways. Power is applied to a rack which meshes with a pinion mounted on a heavy shaft having long bearings on either side of the pinion. The rack is of special steel, and the pinion of hardened steel and cut from the solid. The rack and pinion are designed to mesh exactly on the pitch line and the broach is attached so that the pull is directly on the pitch line of the rack. Vertical adjustments are made at the face plate. A gear stub tooth designed by the Fellows Gear Shaper Co., is used in the rack and driving pinion.



Rack and Pinion Are Designed to Mesh Exactly on the Pitch Line. The broach is attached so that the pull is directly on the pitch line of the rack

The teeth of the rack are on the under side and the rack supported in proper mesh with the driving pinion by means of rollers on the sides of the pinion and guide bars fastened on the side of the rack. In this way rolling contact on the pitch line is secured. The radial thrust of the driving pinion against the rack is taken by three hardened rollers, adjustable for wear. The pinion shaft is driven by a phosphor-bronze worm wheel and a hardened steel worm, running in oil, the worm shaft having ball-thrust and radial bearings. All other important bearings are bronze-bushed and ring-oiled.

Rapid return is accomplished by an internal gear cut on the worm wheel and driving the return gear shaft, the return motion being applied through the driving pinion. There are no high-speed gears, the fastest gear speed used having a surface speed of 60 ft. per min. The clutch is not operated during the cutting stroke, acting only as a positive coupling. No friction clutches are employed and all parts are protected from shock due to a positive clutch under load. In operating, the belt is first shifted to the loose pulley, thus relieving the load from the clutches. Further movement of the shifting lever applies a friction brake to the driving pulley and withdraws the positive clutch, still further movement of the lever engaging the reverse clutch, shifting the driving belt to the tight pulley and reversing the machine.

Automatic adjustable stops are provided and also non-removable emergency stops. A single lever conveniently placed controls every motion of the machine, control being further simplified by having the direction in which the operating lever is moved the same as that in which the rack will travel. The machine has but one speed and no countershaft is necessary. Cooling fluid is supplied by a gear-driven pump of adequate capacity. Three point suspension is a feature and all adjustments have been simplified and the entire mechanism made easily accessible.

The maximum pulling effort requires 15 hp., although all ordinary broaching operations may be handled with a 10 hp. motor. The machine is furnished in belt and motor drive, there being no change in construction necessary for either style. It is placed on the market as the Velco No. 4 production type broaching machine.

To Discuss Uniform Cost Methods

At the second international cost conference under the auspices of the National Association of Cost Accountants, to be held in Cleveland on Sept. 14, 15 and 16, one session—on Thursday morning, Sept. 15—is to be devoted to a discussion of uniform cost methods as used by the trade associations.

This subject has received a great deal of attention during the past few months as a result of the various investigations which have been made of the activities of the trade associations. There is a great deal of popular misapprehension as to the purposes and methods of uniform costing. It will be the object of this session to discuss all phases of the subject. Trade associations which have had actual experience with uniform methods will be officially represented. The Federal Trade Commission, it is expected, will also have an official representative present. It is hoped that as a result of this discussion some of the uncertainty as to how far it is legally possible to go in the matter of uniform accounting methods will be removed.

It appears that more than one hundred trade associations have made some progress along the line of uniform cost methods. No previous attempt has been made on such a large scale actually to get at the results which may be obtained from these systems.

Among other subjects of the cost conference are the following:

Executive Uses of a Cost System.

The Distribution of Overhead Under Abnormal Conditions.

Cost Systems as a Means of Preventing Waste.

Uniform Methods and Standardized Costs.

Interest as an Element of Cost.

The national headquarters of the association are located in the Bush Terminal Sales Building, 130 West Forty-second Street, New York.

Improvement in Demand for Refractories

PITTSBURGH, Aug. 29.—Business in refractories in the Pittsburgh district is somewhat quieter than it was recently, but in practically all other districts, especially those in which are located sheet and tin plate mills, the report about business is one of improvement. There is no tendency on the part of the blast furnace and steel plant interests to anticipate their requirements, even in Ohio, where business is comparatively good. Only actual requirements are being bought, but buyers are so insistent on early delivery as to indicate that their stocks are getting pretty low.

Prices are holding fairly steady at the levels established a few weeks ago. Suggestions are heard of price concessions here and there, but as a rule the reduction offered from regular quotations is extremely slight. The claim is common that there is no money in either fire clay or silica brick at to-day's prices. It is pointed out that freight rates are up 100 per cent as compared with 1914, and that there has been practically the same increase in labor costs. When it is considered that four tons of clay are required to make 1000 brick, it can be readily understood how present freight rates are affecting manufacturing costs.

We quote per 1000 f.o.b. works:

Fire Clay	High Duty	Moderate Duty
Pennsylvania	$34.00 to $40.00	$28.00 to $34.00
Ohio	34.00 to 38.00	28.00 to 33.00
Kentucky	33.00 to 37.00	30.00 to 35.00
Illinois	35.00 to 40.00	30.00 to 35.00
Missouri	37.00 to 42.00	28.00 to 33.00
Silica Brick:		
Pennsylvania		33.00 to 35.00
Chicago		38.00 to 42.00
Birmingham		46.00
Magnesite Brick:		
Standard size, per net ton		65.00
Chrome Brick:		
Standard size, per net ton		52.00

Steel Makers Heard on Metal Tariff

FERROALLOY DUTIES DISCUSSED AT LENGTH

Ferromanganese Manufacturers Ask Protection for a Newly Established Industry —Some New Classifications Asked and Changes in Wire, Pipe and Wide Strip Duties—Sheffield Tool Steel Companies Make a Statement

BY L. W. MOFFETT

WASHINGTON, Aug. 30.—In direct terms, the position of the independent steel manufacturers of the country relative to the metal schedule of the Fordney tariff bill was made known last week to the Senate Committee on Finance. Representing a prime industry with an enormous capital investment, with much at stake in the enactment of the proper duties on imports, those who appeared spoke forcefully and with knowledge. A strong impression was made upon the committee, even upon those members who were not in sympathy with the claims of the industry. The force of the arguments was not alone in the supporting evidence contained in written statements, but also in the information freely given extemporaneously in answer to the questioning of Senators. So interesting was the recital that the hearing was not completed in the three days originally allotted to the metal schedule. The hearing was not closed until to-day, making seven days in all, though during this period some time was devoted to other schedules. Most of the steel producers, including a number of well-known leaders in the industry, appeared on Thursday.

Except for their vigorous objection to what they consider high duties on raw materials—including manganese ore, ferroalloys, magnesite and graphite—the steel producers had little complaint to make of the rates proposed on their products as a whole. A number of suggestions were made for reclassification, with here and there a slight increase in duties, and a request to transfer barbed wire from the free to the dutiable list, giving it the same duty as plain wire. There was also a suggestion to lower rates, as in some sizes of welded pipe and in certain wire. The moderation of the steel interests elicited from Chairman Penrose the statement that not only had they made modest requests but that the schedule on steel products carried lower rates than any other in the bill. The attitude of the steel men was that the industry has reached a new point of expansion in the development of export business. And with this in mind the steel men showed that they do not want to erect any undue barriers, their idea of protection being such as would cover the difference in labor cost.

The producers of manganese, ferroalloys, magnesite and graphite were fully alive to the fact that the rates proposed on these products were the storm center. The committee was made fully cognizant of this fact and is apparently giving much study to the issue. Senator Smoot perhaps showed more interest than any other member of the committee on this point. In commenting on proposed duties on manganese ore, he said there would be "no legislation on the 5 to 30 per cent grades." Whether accurate or not, the interpretation placed on this remark was that ore of a lower manganese content than 30 per cent would not be made dutiable.

Sheffield Steel Men Heard

To-day the committee heard a delegation from the Chamber of Commerce of Sheffield, England, with regard to high-speed steel rates. Arrangement for hearing these interests was made with the committee by the State Department at the request of the British embassy in Washington, to which the Sheffield men transmitted a request that the hearing be arranged. While it is said to be unprecedented for a foreign delegation to appear as interested individuals at a hearing concerning tariff legislation in this country, the committee has pointed out that the Sheffield men came as private citizens and not as representatives of the British government, and also that it is not unusual for foreign delegations to appear before committees of Congress regarding other matters. The Sheffield delegation consists of Arthur Balfour, of Arthur Balfour & Co.; S. J. Robinson, of William Jessop & Sons; Peter Macgregor, of Sanderson Bros. & Newbould, and J. C. Ward, of Edgar Allen & Co.

The committee will suspend tariff hearings to-morrow and go to work in executive session on the tax bill, which is to have precedence over the tariff bill and will be reported to the Senate on Sept. 21, when Congress reconvenes.

Steel Makers Oppose Duties on Raw Materials

Making observations on the entire metal schedule as well as on the whole tariff bill, Chairman John A. Topping of the Republic Iron & Steel Co. spoke for the independent steel companies and was kept before the committee for more than an hour. He was questioned closely and proved his ability to meet sharp examination, being able to give offhand a wide range of figures and facts. On several occasions he had mild tilts with Senator LaFollette of Wisconsin, who put questions that it was either impossible to answer or that related to matters not to be divulged.

Senator LaFollette had prepared a set of questions which he said he would mail to the steel trade witnesses as well as to others, adding that of course it remained with them whether they gave answers. Like others who testified on the metal schedule, Mr. Topping said he would answer those questions that could be properly answered, but would reserve the right not to answer those he considered were not proper. Senator Penrose interposed to say that response to some of Senator La Follette's questions would be equivalent to making an income tax return, information which the Treasury Department is bound not to make public. Senator LaFollette said he would state on the floor of the Senate when the tariff bill is up for debate what questions witnesses had declined to answer and would make use of replies given but would not reveal the names of those making response to such questions as deal with capital investments, costs of production, dividends paid, profits made on given products, salaries paid officers, etc. The greater part of the information no doubt will be supplied to him, and much of it was given by Mr. Topping as to the Republic company by submitting its regular public reports.

Taking up the outstanding features of the metal schedule, as suggested by Chairman Penrose, Mr. Topping said that rates it carried are quite low and steel

producers, consider it a bill to obtain revenue rather than to afford protection, but that manufacturers, are inclined to accept the schedule, because tied in with it are such features as American valuation, anti-dumping, bounty and reciprocity.

His attitude toward duties on raw products was soon made clear. The duties proposed on such products as manganese ore, ferromanganese, zinc, magnesite and fluorspar, would result he said in an annual increase of $23,805,000 to independent producers in the cost of making soft steel. This, he stated, cannot be paid if the industry is to meet foreign competition and expand.

(Mr. Topping's statement appears on a later page.)

"Your idea is that rates on ferroalloys are too high if steel rates are not increased?" suggested Senator Smoot.

"Yes," replied Mr. Topping, "this schedule is lower than that in the Payne-Aldrich bill, even with the American valuation plan applying." He said steel makers were, however, sustaining the Fordney bill and the American valuation plan, generally, but objected to the duties proposed on raw materials.

Steel Companies' Losses To-day

Current prices of steel were said by Mr. Topping to be $5 a ton lower than the cost of production.

When asked by Senator LaFollette as to the finances of the Republic company, Mr. Topping said it had accumulated a surplus of $38,000,000 in a period of more than 20 years but that this is being dissipated rapidly. Senator LaFollette seemed to be irritated because Mr. Topping could not tell him the amount of the original capital invested in the units which were taken over and consolidated. Answering further questions by Senator LaFollette, Mr. Topping said that he doubted that any steel company would show an earning power comparable with bank and trust companies. He added that he did not believe it would be over 8 per cent.

"Steel duties in the Payne-Aldrich act," said Mr. Topping, "averaged about one-half of those in the Dingley law, while those in the Fordney bill are less than those in the Payne-Aldrich measure."

"Rates in the steel schedule," said Senator Penrose, "are more moderate than in any other schedule and the requests of steel men have been modest."

Mr. Topping said the average ad valorem rate in the Fordney bill is 15 per cent.

Senator McLean inquired as to the number of men engaged in the alloy industry to which Mr. Topping stated he could not say specifically but that "it is a mere bagatelle, lost in the crowd and forgotten when compared with the steel industry," and that comparatively its capital investment is small.

Independents Will Make Alloys

"We think domestic producers of alloys will live on much less," said Mr. Topping. "We are asking for duties of 15 to 20 per cent. They are asking for duties of 35 to 215 per cent. If it is necessary we will put in electric furnaces and produce our own alloys. We shall do this if the duties are too high."

He estimated that proposed duties on ferrosilicon would cost $3,000,000 and on manganese $8,000,000 annually in producing soft steel. "We could form a co-operative company and put on blast furnace capacity to make ferromanganese and will do it before we pay exorbitant prices. We could import the manganese ore and still be ahead $17 a ton after paying the ore duty."

Asked by Senator Penrose about employment and operating conditions in the steel industry, Mr. Topping said nominally it engages about 1,500,000 men from the mines to the finished products but today the number is about 300,000 and operations range from 25 to 30 per cent. Mr. Topping stated that at no time since he became connected with the steel industry in 1878 was there a depression comparable with that now existing. He said that the Republic company is feeding men out of its commissary in Alabama to keep them from starvation. The company at full operation employs 15,000 men, and is now employing 3000.

Senator Simmons asked as to the cause of the depression. Mr. Topping said that it is due to the cost of fabricating, transportation, and labor and of building materials such as brick, cement, etc. These costs are so high that a builder could not afford to put up a building in Washington, for instance, even if the steel needed were given away and whose cost was said to be only 12 per cent of the total. The steel trade, he said, is paying labor today 53 per cent more than in 1913 while steel prices have declined greatly since January, 1921. The steel maker, it was pointed out, buys far less labor and transportation with a dollar than in 1913, but when increased costs are considered is selling at practically pre-war prices.

Some Reductions Suggested

President James A. Campbell of the Youngstown Sheet & Tube Co., appearing as a representative of his company and several other independents, especially makers of steel pipe, tubing and wire products, recommended reductions in some duties and increases in others, as shown in his brief printed below. The distinction made in the wire paragraphs as proposed were declared by Mr. Campbell to penalize one class of users for the benefit of others and this was called "class legislation." He said he was sure that the committee could be justly criticized if it permitted the paragraphs to stand as they now are.

Mr. Campbell agreed with Mr. Topping in protesting against duties on raw materials, including fluorspar, manganese ore, ferromanganese, magnesite, pig tin, zinc and alloys. He stated that American producers do not require this abnormal protection and if there are any cases where they do, the interests are so small and can produce such a small percentage of the material required that their needs should not be permitted to impose this tax on all steel consumers. He said he hoped the duties would be greatly reduced.

"Profits" on Barbed Wire

"What are your profits per ton on barbed wire?" inquired Senator LaFollette.

"Oh, I think we lose about $5 per ton," responded Mr. Campbell dryly, whereon quiet laughter swept over the room.

"What would be the consequence if we built rates so high as to shut out imports?" asked Senator Walsh of Massachusetts.

"That would build a tariff wall and ruin the country, creating industrial depression and fictitious values, and the depression would continue until there would be a breaking down of industry." Mr. Campbell said, however, he favored protection on finished products sufficient to maintain the American standard of living for workmen. He vigorously assailed the transportation and Adamson acts and said both had broken down and should be wiped off the books. Both acts were declared to be holding business by the throat. It was added that buying power, especially that of the farmer, has shrunk, and that high transportation and labor costs are at the bottom of it. Not until purchasing power has been restored to a normal basis, can there be an adequate revival of business, but if the farmer and manufacturer were brought to the same level, it was added, the sprag would be removed from the wheels of industry and in 90 days it would start up in good shape.

Midvale and Bethlehem Protest

President A. C. Dinkey, of the Midvale Steel & Ordnance Co., said the proposed duty on ferromanga-

nese would add 30c. to the cost per ton of soft steel ingots. The effect, he pointed out, would be to increase costs at a time when the industry is expecting foreign countries to absorb from 15 to 20 per cent of the production. He asked that manganese ore be made duty free with a compensating duty on ferromanganese, $2.50 per ton being suggested, to cover the difference in the labor cost in England and the United States. The Midvale company, he said, normally employs 40,000 men but to-day is employing only 11,000.

The free list for manganese ore and a nominal duty on alloys to protect the domestic industry were suggested by C. A. Buck, vice-president Bethlehem Steel Co. He strongly opposed the duties proposed on chrome, manganese, ferromanganese, tungsten and ferrosilicon. The proposed duty on ferromanganese, he said, would amount to $39 a ton, while before the war it was bought at $35 to $40 a ton. He said he would like to see a nominal duty on ferromanganese and to have magnesite made free of duty.

Separate Classification for Bars

A separate classification for common merchant bars and a slight increase in duties, also an advance from 7/20c. per lb. to 4/10c. per lb. on structural steel were suggested by Vice-President Willis L. King, of the Jones & Laughlin Steel Co. The chief cost to-day is transportation. The cost at present of assembling raw materials for finished products and shipping from Pittsburgh to New York was $10 a ton more, he said, than before the war. Mr. King said proposed rates on raw materials are beyond reason and, besides adding to the cost to the consumers, would seriously affect foreign trade. The Jones & Laughlin Steel Co. normally employs 25,000 to 26,000 men, Mr. King said, but at present is not operating at more than 25 per cent of capacity and employing 5,000 to 6,000 men.

President Severn P. Ker of the Sharon Steel Hoop Co., speaking for independent makers, suggested reclassification and increase in rates in hoops, bands, strips and cotton ties, as stated more fully below.

Dr. J. A. Mathews, president Crucible Steel Co. of America, suggested a number of changes in the bill, suggesting free manganese, or not over 10 per cent duty, reduction of the tungsten duties, which would increase the cost of high-speed steel by 20 to 25c. per lb., also proper distinctions between products in paragraph 304, covering ingots, billets, bars, forgings, etc.

Tin Plates and Sheets

Speaking for the Association of Tin Plate Manufacturers, President E. R. Crawford of the McKeesport Tin Plate Co. said that while tin plate makers can get along with the proposed rate of 1 1/10c. per lb. on tin plate, taggers tin and terne plate, after conditions have become normal, they would like to have a duty of 1 2/10c. fixed. Mention was made of the fact that tin plate manufacturers are open to competition on account of low ocean freight rates. He said that while these manufacturers had not complained of the proposed duty of 2c. per lb. on pig tin, they thought it was not justified and would be better stricken out, though perhaps the Government favors the duty as a source of revenue. Mr. Crawford protested against the duties proposed on raw materials, including fluorspar, magnesite and ferromanganese.

W. H. Abbott, of the Wheeling Steel Corporation, representing independent sheet makers, said that while the duties on sheets in the Fordney bill are adequate generally, they are not entirely so for mills located along the Atlantic seaboard. Labor costs of domestic production were said to constitute 80 per cent of the total cost, direct and indirect, and to have increased 72 per cent from 1912 to 1921. He pointed out also the low wages paid in Europe as well as the ocean freight rates, which make mills along the Atlantic seaboard open to sharp competition.

Pig Iron and Scrap

John W. Logan, secretary Alan Wood Iron & Steel Co., Philadelphia, asked for a duty on pig iron of $2.50 (instead of $1.25), the same as in the Payne-Aldrich act, and that a differential of $1.50 less be fixed on scrap. In the Fordney bill both products take a duty of $1.25 per ton. Mr. Logan pointed out the importance of transportation as a factor in pig iron cost. He said that today pig iron is selling at $19 to $20 a ton and of the cost 70 per cent is represented by transportation of raw products, amounting to six tons required to make a ton of pig iron. He added: "Our costs are higher, due to the longer hauls and higher transportation charges on our raw materials. Low water transportation rates facilitate delivery of European iron and steel to Eastern seaboard markets; the ocean freight being frequently less than the cost of hauling from even Pittsburgh to the same position. On account of its character and adaptability as ship ballast, pig iron is often carried across the Atlantic for comparatively trivial rates."

Protest was made by Mr. Logan against the rates carried on calcined magnesite, fluorspar and ferromanganese:

> Leaving to other steel companies who have appeared, or expect to appear, before your committee with respect to duties on calcined magnesite, fluorspar and ferromanganese, the presentation of specific arguments and recommendations, we desire to record our protest against the rates proposed as being very much too high. We are not opposed to any reasonable protective duties on our raw material, but the suggested duties on the three materials above referred to are so unprecedented that we feel we must protest. They are entirely out of line with the duties on various forms of finished steel contained in this bill, which duties we believe to be just and reasonable.

William Dette of Crocker Bros., New York, importers of ferromanganese, recommended a duty of not more than $1 per ton on ores containing 45 per cent manganese or over, and $2.50 per ton on ferromanganese. The latter, it also was said, being a blast furnace product, should be classified with pig iron and spiegeleisen. In speaking of manganese ore, Mr. Dette said:

> Manganese ores have always been admitted free. The domestic supplies are limited, inferior in quality and far from consuming points. Even under the stimulus of war necessity and high prices domestic production furnished only a small part of our total needs and that only by a sacrifice in quality of the smelted product. It is safe to say that the steel trade must depend for all time on foreign ores or foreign ferromanganese for at least 90 per cent of its requirements.

In urging that ferromanganese be classified with pig iron, Mr. Dette stated that the former is not a ferroalloy in the sense of other alloys in paragraph 302, which are made either by the electric furnace or the Thermit process, and which are added to special steels for properties conferred by the metal, such as tungsten, chrome, etc. Ferromanganese is a product of the blast furnace and is made the same as pig iron and merely requires more fuel and more limestone for fluxing and is cast in a bed and broken into lumps instead of being cast in pigs. The price of ferromanganese at present, it was said, is about $65, and on that basis the proposed duty of 2-1/5c. per lb. is equivalent to $39 or $40 per gross ton, or 80 per cent of the pre-war price and 60 per cent of the existing price. He argued that interests of the independent steel makers require the restraining influence of foreign competition "to prevent a repetition of the unreasonable prices which pre-

vailed when this competition was temporarily reduced. The rates in the present bill are not only high but are not proportionate. At the rate of $11.20 per ton on ore the tax on ore to make one ton of ferromanganese is $24.64, while the finished product [ferromanganese] is taxed $39.42."

President Campbell on Wire and Pipe

J. A. Campbell, president the Youngstown Sheet & Tube Co., Youngstown, Ohio, filed a brief in behalf of his company and also as the representative of other independent steel companies; especially those making steel pipe, tubing and wire products. He said:

"With reference to schedule 3, paragraph 328, pertaining to butt welded and lap welded pipe, I beg to say that the duty proposed of ¾c. per lb. is greater than is necessary to protect this interest; and, therefore, I would recommend that the duty on butt welded and lap welded iron and steel tubes, in sizes from 1 in. to 6 in. inclusive, be made 6/10c. per lb. instead of ¾c.; and that sizes of butt welded pipe, from ⅜ in. to ¾ in. inclusive, and also lap welded pipe larger than 6 in. carry a duty of ¾c. per lb. as proposed. I suggest this change to your committee, for the reason that the smaller sizes of butt welded pipe and the larger sizes of lap welded pipe carry a greater labor cost than what we call the 'base sizes,' from 1 in. to 6 in. inclusive. These sizes on which I propose a lower duty are the common sizes of pipe, and the tonnage is considerably greater than the smaller sizes and larger sizes mentioned. I think the proposed duty on sizes smaller than ⅜ in. is justified, on account of the small production per man and high labor cost.

"With reference to coated conduit for electrical conductors, referred to in this paragraph, I would say that we are large manufacturers of this product, and that 25 per cent ad valorem is ample protection.

Duty on Wire Rods

"With reference to paragraph 315, pertaining to wire rods, the duty propcsed in the bill of 3/10c. per lb., or $6.72 per gross ton, is sufficient, and I do not think it should be increased or decreased.

"In discussing paragraph 316, pertaining to black and galvanized iron and steel wire, I am also obliged to discuss paragraph 317, pertaining to galvanized wire used for fence, galvanized wire fencing, and wire for baling purposes.

"In paragraph 317, you propose a duty of ½c. per lb. on galvanized wire used for fencing purposes and for making into wire fencing and wire used for baling purposes; while in paragraph 316 you propose a duty on this same wire when used for other purposes of ¾c. per lb. It seems to me that the committee in framing this paragraph has overlooked the fact that it penalizes one class of users of this material for the benefit of others who use it for fencing and baling purposes only, and that this is 'class legislation'; and I am quite sure you could be justly criticized for making this distinction. Therefore, I recommend that you reduce the duty proposed in paragraph 316 from ¾c. per lb. to 6/10c. per lb., with the addition you now propose of 2/10c. per lb. for coated wire for all purposes; and that paragraph 317 be stricken out. There certainly can be no good reason offered by anybody why any class of users should be given preference over any other class; and while the duty I propose is smaller, perhaps, than it should be, it will safeguard to a certain extent the users of wire covered in paragraph 317 against unduly high prices, and will still afford sufficient protection to the interests affected by paragraph 316.

Labor Cost to Be Considered

"Referring to paragraph 331, pertaining to nails and spikes made from iron and steel wire, I beg to call your attention to the fact that this proposes 4/10c. per lb. on nails, which carry a labor cost $12 per ton higher than wire; and as it is my understanding that you wish to protect the labor employed in producing these nails to the same extent that you would protect labor producing the wire from which they are made, it naturally occurs to me that the committee framing this bill did not have sufficient information on this subject, and, therefore, has not provided sufficient duty to protect the labor engaged in the manufacture of nails. If this is the principle by which your committee is to be guided, then wire nails should carry a higher duty than plain wire, for the simple reason that the labor cost in producing this product is considerably greater, as above stated. With this fact in mind I would, therefore, recommend and strongly urge that paragraph 331 should be changed so as to provide a duty of ¾c. per lb. instead of 4/10c. per lb. on the common sizes of nails and spikes, and other sizes in proportion.

"I wish to call your attention to another wire product, viz.: barbed wire, both plain and galvanized, which is on the free list, schedule 15, paragraph 1679. I cannot understand the purpose of the ways and means committee in proposing that barbed wire be put on the free list. The cost of wire that enters into the manufacture of barbed wire is fully as great as that of wire for fencing or other purposes. Labor in making this wire and in manufacturing it into the finished product, barbed wire, is certainly entitled to the same protection as the labor employed in making wire for other purposes; and it would be rank discrimination to treat it other than on the same basis. If the manufacturer of barbed wire is compelled to meet foreign competition without any protection, he will be forced to reduce labor that enters into the manufacture of this wire to the very minimum, and may be put out of business entirely. I do not believe that this is the idea of the ways and means committee or the Senate Finance Committee, and if it is, I certainly hope that it is not the idea of Congress as a whole; and that this item of barbed wire will be put on the dutiable list and treated the same as other wire products.

Protect All Interests

"It is my impression that in framing this tariff bill it was the intention of the House Ways and Means Committee to protect all American interests—the farmer, invested capital, and especially the laboring people. I appreciate the difficulty that confronted the ways and means committee in framing a bill that will do exact justice to all the interests concerned. All interests are selfish; especially those that ask you to do things that would be an injustice to others. For that reason you should secure the facts and do what is best for the people as a whole, rather than to give undue protection to any one interest at the expense of many.

"Many producers in different lines may have high costs, due to antiquated factories or methods, or to disadvantage in their geographical location; but if there are such, their interests should not be considered to the detriment of the country generally.

High Duties on Raw Materials

"While I am not supposed to discuss duties other than those on pipe and wire, I desire to emphasize, if possible, what Mr. Topping has said with reference to duties on raw materials.

"The proposed duties on fluorspar, manganese ore, ferromanganese, magnesite, pig tin, zinc, and alloys will put considerable tax on the steel industry, which the consumer must pay. Mr. Topping has explained that American producers do not require this abnormal protection, and if there are any cases where they do, the interests are so small and can produce such a small percentage of the material required that their needs should not be permitted to impose this tax on all steel consumers. The duties proposed on these articles are all too great in my opinion, especially those on fluorspar, manganese ore, ferromanganese and magnesite, and I trust they will be greatly reduced by your committee.

"It should be understood that in recommending lower duties on some tubular and wire products than those proposed in this bill, I do so believing that the entire bill will finally provide for a moderate duty on all

classes of merchandise. If this bill, as a whole, is so framed that the result of its passage would be to increase the cost of living and labor, in that event we need higher duties than those I have suggested.

"As Mr. Topping states, we will be obliged to export 20 per cent of our steel if we are to keep our mines and mills in operation and give continuous employment to our workmen, and anything that adds to our costs will make this more difficult and also increase the selling price to our domestic consumers.

General Observations

"In this connection I would like to make a few observations on the tariff generally in the hope that practical ideas and experiences may be of service to your committee.

"Conditions are abnormal throughout the world and the quicker readjustments are effected, the better for everybody; so it seems to me that your tariff bill, when completed, should be based on what we may think are normal conditions and values, rather than on conditions that obtain at present. If it has the effect of speeding readjustments to lower values on a more stable basis, it will be of great benefit. Wages and materials in other countries must increase or wages and materials in the United States must decrease before values are stabilized. Both will happen; wages and materials will be lower in the United States and higher abroad. A reasonable tariff bill will bring this about quickly; a tariff too high will prolong this readjustment and in the meantime the country will suffer.

"I believe in the American standard of living and desire to see it maintained, but I am not so much concerned about the rate of wages paid as about what the wage earner has left after paying the cost of living by this standard. Duties that are too high will raise values, increase the cost of living, stop exports, cause unemployment, and finally cause industrial depression. You are expected to frame a tariff bill that will maintain the American standard of living and yet permit us to export our products to the markets of the world. This cannot be accomplished by a bill that will materially increase the cost of production."

Various Changes in Metal Schedule Urged

John H. Brewster, New York, filed a brief asking for the maintenance of differentials on crucible and electric steel on one hand and bessemer and open hearth steel on the other in the paragraphs dealing with ingots and semi-finished products and the one dealing with wire rods.

Nelson Franklin, Denver, representing the Rare Metals Ore Co., appeared before the committee to sustain the proposed rate of 45c. per pound on the metallic tungsten content provided for tungsten ore or concentrates, but claimed a higher duty would be justified.

Wallace L. Pond, Nicholson File Co., Providence, R. I., manufacturer of files and rasps, asked for an increase of duties over the Fordney bill rates, ranging from 25c. to 77½c. per dozen. He referred to the skilled and high priced labor required to make these products. Certain classes of files, largely the smaller and more finely cut, are being imported from various European countries in considerable quantities. He recommended rates of 40c. per dozen on sizes 2½ in. and under, 75c. per dozen on 2½ in. and not over 4½ in.; $1 per dozen on sizes over 4½ in. and under 7 in., and $1.20 per dozen on 7 in. and over.

Attorney Harold H. Burton, of Cleveland, representing the inventor, Dr. Aladar Pacz, and the producers of alpax and new silicon-aluminum alloys, urged that paragraph 302 be amended to continue free of duty silicon with 5 per cent or less of iron. He pointed out that this grade of silicon is separate from ferrosilicon used in commercial quantities in the general practice, but is used in the manufacture of alpax, which is being developed by the General Aluminum & Brass Mfg. Co., Detroit, owner of the alpax sand casting license. This new alloy substitutes silicon for copper and aluminum in the manufacture of castings. It was stated further that the manufacture of the new product is an infant industry undertaking to compete with commercial aluminum, and in some cases with products of copper, brass, cast iron or even steel. It requires for its manufacture silicon metal containing 5 or less per cent of iron and it affords the only known commercial use for that grade of silicon. It is hoped that the required grade of silicon can be produced in this country at less than 22c. per lb. and if this comes about it was argued that the tariff should be less than 8c. per lb., which is proposed on 90 per cent or more ferrosilicon. Mr. Burton stated that the new alloy is being used in the United States, particularly in the casting of automobile parts.

A Plea for Chrome Ore

Dan Sutherland, representing mining interests in the West and in Alaska, asked that chrome ore be made dutiable at 60c. per unit of metallic content, or $30 per ton when 50 per cent oxide and $25 per ton on the ore when 40 per cent oxide. He expressed the opinion that there are ample chrome ore deposits to supply the requirements of American steel interests. He made the point that domestic chrome ore is produced by American labor, while that mined in Caledonia is produced by convict labor and that of Africa by Kaffir labor; also that manganese ore is in the same class with chrome in that manganese ore has never been sought extensively but would be, if sufficient value were placed on it.

J. W. Hoffman, for the American Brass and Copper Statistical Exchange, New York, asked for a reclassification of the brass, copper and bronze paragraph, 378, and filed a brief carrying the proposed changes, the plan of which is to grade the duties more in accordance with the cost of production and the value of the semi-finished and finished articles. The rates asked for are not easily comparable with those existing because they are based on a rearranged classification. He said that wages in the industry in the United States are from 90 to 120 per cent higher than in England. Wages in Germany were said to be from 60 to 80 marks per day.

Egbert Moxham, the Conley Foil Co., New York, speaking for tin foil manufacturers of the United States, opposed the Fordney schedules on tin and lead. He said the latter carries approximately 50 per cent protection under American valuation and that the duty of 2c. per lb. on tin, an imported metal, is too high, asking that tin be left on the free list. If the above suggestions are not adopted, he said, the rates on tin foil should be increased.

Changes Sought on Aluminum

Laurence M. Brile, president of Brile & Ratner, New York, urged that aluminum coils be included in paragraph 374 of the Fordney bill, carrying a duty of 5c. on aluminum scrap and 7c. on aluminum plates, etc., but protested against the duties themselves. The concern represented by Mr. Brile is an importer of crude and finished aluminum from Switzerland and contends that the rates in the bill are prohibitive.

Senator Penrose said that three foreign corporations, English, French and Norwegian, control a large part of the aluminum output of Europe, according to a report made to the committee, and if protection is not given domestic producers the consumers in this country would be at the mercy of foreign manufacturers.

Harris E. Galpin, Muskegon, Mich., speaking for the National Aluminum Foundries Association, protested against increases over the Underwood-Simmons rates on crude and finished aluminum. The respective duties in the present law are 2c. and 3½c. per lb., which the Fordney bill raises to 5c. and 9c. respectively.

Protection for Zinc

Eugene Wolff, representing the American Zinc Institute, said the condition of the zinc industry in the United States has grown worse due to importations. He said the zinc ore duty in the Fordney bill is made

permanent, while the products are given two years' protection at the specified rates, which are to be lowered after that time. He asked for rates as follows: Ore up to 10 per cent, free; 10 to 20 per cent, 1½c.; 20 to 25 per cent, 2c.; zinc dust, 3¾c.; slab zinc, 2¾c.; sheets, 3¾c.; coated sheets, 3¾c.; old and worn out, 2¾c.

Arguments on the same paragraph and of similar nature were made by Otto Ruhl, Joplin, Mo., who said that during the war large quantities of zinc ore came into the United States from Mexico and have come in later and that the domestic industry has been seriously affected, although it was conceded that this is partly due to the general industrial depression.

F. C. Wallower, also from the Joplin district, made arguments similar to those of Messrs. Wolff and Ruhl.

A. C. Dinkey Opposes Manganese Duties

A. C. Dinkey, president Midvale Steel & Ordnance Co., submitted the following statement relative to manganese:

With respect to manganese ore and ferromanganese, the outstanding facts are:

(1) That the use of manganese is absolutely necessary in the production of steel.

(2) That in only three districts in the world are there deposits of sufficient size to support the production of ore on anything like a scale commensurate with the needs of the steel industry; viz., India, Russia and Brazil.

(3) That within the borders of the United States no prospect has been found, even under the spur of war necessity, which it is reasonable to suppose will support a mining operation on an economic basis, either as to quantity, quality or cost.

(4) That ore from India, Russia and Brazil can be laid down at Atlantic ports for about $12 per ton. Approximately this sum must be paid for railroad freight alone from such small manganese ore mines as there are in the United States to the chief domestic consuming point of such ore.

(5) That the foreign steel industry (England, Germany, France and Belgium) draws its supply of manganese ore from these same far-off fields, costs to them being about the same as to steel producers in the United States. The present House bill would add about 30c. per ton to the cost of all steel ingots produced in the United States. The folly of doing this while expecting the neutral markets of the world to absorb from 15 to 20 per cent of the finished steel output of this country, on a competitive basis, is apparent.

(6) That the United States Steel Corporation would be less disadvantaged than all other steel producers in this country. The Steel Corporation makes its own ferromanganese almost entirely out of imported manganese ore; all other domestic steel producers generally buy their ferromanganese, either because they do not use ferromanganese in sufficient quantities to justify a blast furnace operation or because they do not have the necessary facilities.

The much higher duty proposed for ferromanganese than for manganese ore would have this effect: Every ton of ferromanganese used by the Steel Corporation would cost it, in duties, $23.65 per ton (i.e., the duties on ore). All other domestic steel producers would pay $39.42 per ton in duties (i.e., the duty on ferromanganese). We ask for free ore and a small tariff on ferromanganese—not more than $2.50 per ton, the same as in the Payne-Aldrich bill.

To-day the steel manufacturers of foreign countries and all manufacturers of this country are on substantially the same footing with respect to their supplies of manganese ore. Why, then, handicap manufacturers of the United States in favor of their competitors in England and Germany?

A compilation of supporting data prepared by the Midvale Steel & Ordnance Co. is filed herewith. [Extracts from this statement appeared in THE IRON AGE of Aug. 4, page 288.]

Vice-President King Proposes New Bar Classification

Willis L. King, vice-president Jones & Laughlin Steel Co., Pittsburgh, said that the company is a large manufacturer of steel products in many forms, the more important of which are steel bars, structural shapes, plates, wire products, pipe, tubes, and tin plate, and is, therefore, vitally interested in securing adequate protection in the proposed new tariff, not only for the steel industry and its workmen, but for all other American products which can be produced in Europe and elsewhere more cheaply.

"In the main," said Mr. King, "we agree with the general statement of John A. Topping on both finished and raw materials. On a comparative basis of labor and other costs here and abroad, the duties on common steel products fixed in the House Bill 7456, are inadequate, but we appreciate that changes must occur as the world progresses toward normalcy, and that the tariff should anticipate these changes. Knowing the difficulty in securing accurate information as to foreign labor costs, efficiency, and other conditions, and the uncertainty of the future, we are not able, even if disposed, to dispute your prognosis of the future as it may appear in this bill.

Increased Cost of Transportation

"The chief element of cost to the American manufacturer is the increased charge for transportation. Generally speaking, it has more than doubled since the tariff of 1909; but you will, perhaps, better understand the effect on our costs by the specific statement that the cost of assembling the raw material per ton of steel in Pittsburgh, and shipping the steel to New York, where we must meet foreign competition, is $10 per ton more than before the war. This is a cost which we can not control, but are, of course, hopeful of relief, and it can not come too soon for the general good.

"Our appearance here is not to criticise but to call attention to the classification of two, or perhaps three of the finished steel products which has been handed down from previous tariffs, and which we believe can be greatly improved with but slight increase in the duties.

Bars Classed with Other Products

"In fixing the duty on steel bars in the House bill under discussion, paragraph 304, their importance and probability of importation have not been recognized, largely, I think, because they are classed with about 17 other articles or products having no relation in cost or importance, ranging from steel ingots, die blocks, and gun barrel molds to certain alloys. This same classification appears in previous tariff bills, but it covers too much to cover it well. The lower priced brackets are too low for bars, but possibly entirely adequate for the other articles, and the higher priced brackets entirely unnecessary for bars. As to the importance of steel bars, the tonnage is greater than any other single steel product, and the selling price is lower than any other steel product. They are likely to be imported, not only because of their general use, but because they are not usually subject to chemical or physical specifications, can be easily transported in vessels, and more readily sold because of their wide market. Certainly they are important enough to have a separate paragraph in the tariff bill and I hope this suggestion will appeal to you.

"If the American valuation plan is retained, it is not likely that any steel bars will be imported under the first or lowest bracket in paragraph 304, namely, when valued not over 1c. per lb., 2/10c. per lb. duty; but in the second bracket, reading, valued over 1c. per lb. and not over 1½c. per lb., 3/10c. per lb., imports

are entirely possible, and would result in the reduction of American labor to a point below the accepted standard living conditions and comfort, which we earnestly hope will never become necessary. I would, therefore, recommend for your consideration a change in the classification, and slight increase in the duty on common merchant steel bars to read as follows:

Valued not over 1c. per lb.....3/10c. per lb. duty
Valued over 1c. and not over 1½c. per lb...4/10c. per lb. duty
Valued over 1½c. per lb. to 2½c. per lb....5/10c. per lb. duty

Structural Material

"Beams, channels, angles, etc., commonly known as structural material, in paragraph 312 of House Bill 7456, are made dutiable at a flat rate of 7/20c. per lb. Structural material is a large and important tonnage but not as likely to be imported as bars, because of the rigid specifications as to quality, length, etc., necessary for large buildings, but based on competitive costs here and abroad, both present and prospective, the duty of 7/20c. per lb. flat is not adequate. In some previous tariffs, structural materials carried a sliding scale based on the price and there is no logical reason now why they should not carry a sliding scale such as I have suggested for steel bars, but if your committee decides in favor of a flat duty I suggest that it be increased 1/20c. per lb. over paragraph 312, making the duty 4/10c. per lb.

"I do not know whether anyone has been designated to speak to you on steel plates, but the duties specified in paragraph 307 is, in our opinion, fairly adequate. The sliding scale protects manufacturers from foreign competition on a low market but gives the Government higher revenue on a strong market, and would seem to be a principle fair alike to the American industries and the Government. Any increases I have asked or suggested are based on the adoption of the American valuation plan in the new tariff bill.

Duties on Raw Materials Too High

"In closing, I beg your indulgence for a few words regarding raw materials as specified in the House bill under discussion. The rates on these materials are beyond reason, and beside adding materially to the cost of domestic consumers, will have a most serious effect on our foreign trade. The framers of provisions on raw materials doubtless had in mind the desirability of increased revenue for the Government; but in my opinion, it would be poor business policy for the Government to exact a few hundred thousand dollars at the Customs in exchange for many millions of dollars of foreign trade, on which the Government would receive taxes on its manufacture and transportation. The encouragement of steel exports is hardly less important than home protection under present and prospective conditions. The excess war made tonnage cannot be disposed of at home, and the duties fixed in the House bill will undoubtedly prevent the free flow of exports. We are informed that foreign governments, especially Germany, are fully alive to the importance of their export trade, and are making concessions in freight and taxes to their manufacturers, and it is our hope that, in the tariff under discussion, no handicap will be placed upon us."

President Crawford Speaks for Tin Plate Companies

E. R. Crawford, president McKeesport Tin Plate Co., for himself and E. T. Weir, president Weirton Steel Co., representing all the independent tin plate manufacturers of the United States, presented a brief on tin plate, terne plate and taggers tin. He named the independent tin plate manufacturers in the United States as follows:

Weirton Steel Co., Weirton, W. Va.
McKeesport Tin Plate Co., McKeesport, Pa.
Jones & Laughlin Steel Co., Pittsburgh, Pa.
American Steel Co., Pittsburgh, Pa.
Washington Tin Plate Co., Washington, Pa.
Standard Tin Plate Co., Canonsburg, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
N. & G. Taylor Co., Philadelphia, Pa.
Trumbull Steel Co., Warren, Ohio.
Carnahan Sheet & Tin Plate Co., Canton, Ohio.
National Stamping & Enameling Co., Granite City, Ill.

"On Aug. 8, 1921," said Mr. Crawford, "we addressed a letter to Hon. Boise Penrose, chairman, Finance Committee, U. S. Senate, briefly stating our views in relation to the situation with the tin plate manufacturers of the United States and their attitude towards the revision of the tariff and the proposed rate of duty on tin plate, as well as certain rates of duty proposed on raw materials, which are used in the manufacture of tin plate.

Payne-Aldrich Duty Favored

"When the tariff bill was under consideration in the House, we requested the ways and means committee to fix the rate of duty on tin plate at 1.2c. per lb., which was the rate provided in the Payne-Aldrich bill, and which was a substantial reduction on the rate provided in the Dingley bill.

"The Underwood tariff bill now in force provides a duty of 15 per cent ad valorem, which is entirely inadequate, under the present unsettled conditions, taking into consideration the abnormal low rates of wages prevailing in Germany, Belgium and England, as well as the unsettled exchange situation, and exposes this important industry to ruinous competition in all of our seaboard markets where the great bulk of the tin plate manufactured in this country is consumed; the Atlantic and Pacific seaboards are easily accessible to foreign manufacturers, at low ocean freight rates.

"Tin plates are all manufactured in the interior of this country and bear a very heavy freight rate from point of manufacture to seaboard markets. Under the circumstances, we feel that we are entitled to restoration of the Payne-Aldrich rate of 1.2c. per lb. on tin plate, terne plate and taggers plate. The Fordney bill, however, provides a rate of 1.1c. per lb. in paragraph 310.

The Duty on Pig Tin

"After due and careful consideration, the tin plate manufacturers have reached the conclusion that with economies in manufacture which they hope to accomplish as conditions approach a more normal level, they will be able to get along with the proposed rate of 1.1c. per lb. and maintain their position in the home market against foreign competition, despite the fact that the Fordney bill has placed a duty of 2c. per lb. on pig tin, as provided in paragraph 386. There is very considerable opposition to this proposed duty for the reason that there are no commercial tin-bearing ore deposits in this country, and the two tin smelters situated on the Atlantic seaboard produce pig tin from imported tin ores. They sell their product on a parity with the landed cost of imported tin, and there is no prospect of compensating advantage by reason of expected competition from domestic sources, which would eventually reduce price of this commodity to a basis which would be competitive with imported tin.

Revenue Measure Only

"The tin plate industry is the largest consumer of pig tin in this country, but the tin plate manufacturers realize that the proposed duty may be considered a revenue measure, and for this reason they are not disposed to enter strenuous objection to the proposed duty of 2c. per lb. on pig tin, but leave it to the committee to satisfy itself that the smelting companies in this country are entitled to this protection, or that your committee is justified in leaving this duty as a purely revenue measure only.

"The tin plate industry in this country consumes 2,500,000 tons of steel per annum, and employs in direct labor in its own plants, approximately 40,000 workmen, who obtain the highest rate of wages of any workmen employed in the steel industry in this country.

"As large consumers of steel, which we purchase from the steel manufacturers, we are indirectly, but very deeply, interested in the schedule of duty proposed on steel products, which constitute our raw material. The rates proposed in the general metal sched-

ule are extremely moderate, and in our opinion, may be considered to be drawn on a revenue basis, rather than on a basis of protection. The rates on practically all items in the steel schedule are lower than those of the Payne-Aldrich bill, and are on an average of about 50 per cent of the rates in the Dingley bill. We have noted, however, that the Fordney bill proposes extremely high rates of duty on raw materials such as magnesite, fluorspar, manganese ore, ferromanganese and ferroalloys, which are essential and necessary in the manufacture of steel. These proposed rates of duty will unnecessarily increase the cost of our raw materials and will be an increased burden to manufacturers of tin plate and other similar commodities who are using large quantities of semi-finished steel.

"We wish to call the attention of the committee to this situation, particularly because we feel that the proposed rates of duty on these raw materials should be stricken out or modified to a strictly revenue basis, as in most cases they are not competitive, and hence the tariff becomes a tax, without any compensating advantages.

Valuation Plan Indorsed

"We wish also to go on record with your committee that the independent tin plate manufacturers of the United States are unanimously in favor of the proposed American valuation plan, and we would deplore any modification of that plan which would fix the assessment of duty on valuation prevailing in foreign countries, whose depreciated currencies are subject to violent fluctuation in exchange value, as compared with the standard value of the United States gold dollar."

Special Alloy Steels and the Tariff

Dr. J. A. Mathews, president Crucible Steel Co. of America, addressed the committee as a member of the tariff committee of the crucible steel manufacturers of the country and made a number of suggestions for changes in the proposed bill. He said in part:

"It is a pleasure to know that in the pending tariff legislation the return to the sound principle of American valuations is contemplated, thus getting back to a feature of the original tariff bill signed by George Washington in 1789. Under this principle, manufacturers are assured of whatever rates are finally adopted, and not left in uncertainty as to the proportion of those rates actually applying, due to under-valuation and uncertain values, as has been the case under previous bills. The Government will be able to collect more revenue, and imports will be made on the basis of equal or superior quality and not upon the basis of unequal valuations. It is my belief that the Tariff Commission can now function in a more truly scientific fashion than has been possible in the past, and that Congress can arrive with a greater degree of certainty at equitable rates. After a short experience with the American valuation plan it is my judgment that the administrative features will be easier than under the present system."

Doctor Mathews at this point compared the crucible steel industry with other departments on much the same lines as when he appeared before the Ways and Means Committee in January, as reported in THE IRON AGE, January 20, 1921, pp. 197 and 198.

Manganese and Tungsten

Taking up paragraph 302 of the new bill, Dr. Mathews said in part: "In this paragraph very heavy duties are imposed upon the ores and raw materials which are an essential part in the manufacture of tool and alloy steels. This is a radical departure from the traditional policy of cheap raw materials for manufacturers, coupled with suitable protection on finished articles the manufacture of which involves much labor.

"It is difficult to understand why manganese ore and tungsten ore should suddenly require protection in an amount of something over 100 per cent of their pre-war values. No great deposits of these ores have been discovered. We shall have to go abroad for our principal sources to the great deposits in foreign lands.

"Manganese may be considered as a steel-making necessity, and compared with it all other alloying materials mentioned in this paragraph may be termed luxuries. The proposed duty of 1 cent per pound on metallic manganese in ores "containing in excess of 30 per cent" is in itself an admission of the low quality of our domestic ores. This material should be restored to the free list, or possibly protected to the extent of 10 per cent as a revenue measure.

"The proposed rate of duty on tungsten ores and concentrates is about 250 per cent of the present selling price, or 125 per cent of the average pre-war selling price. Our company is a very large buyer of tungsten ores. In the years before the war over one-half of this material was of domestic origin. During the war period, when the prices were so high and the difficulties of obtaining foreign shipments were so great, we had to rely more and more upon foreign sources, and for the past three years we have bought no domestic ores. The demand for tungsten during the war was so great that many were induced to work tungsten properties which were of little value, and it is poor economics to continue the operation of such properties by reason of an exorbitant rate of duty, particularly since they cannot under any circumstances take care of the country's normal needs. The rates for both tungsten and manganese seem to be predicated upon the extremely high costs during the war period rather than upon the basis of operation in normal times.

"In the case of molybdenum ore we have a little different situation. Of all the alloying materials used in the steel industry molybdenum seems to be the only one of which we possess an adequate domestic supply. The use of this metal is a new development in steel metallurgy and the production of molybdenum is an infant industry which, we believe, is entitled to some protection. We feel that the rate proposed of 75c. per unit is too high and should be changed to not over $10 per ton.

"The rates proposed on the ferroalloys made from these three ores are in the nature of compensatory duties made necessary by the extremely high rates imposed upon the ores themselves. If the rates on the ores are reduced, as they certainly should be, then these rates on the ferroalloys should be correspondingly reduced. The rates on the other ferroalloys are needlessly high, and seem to be based upon wartime conditions, and not on any normal basis of costs. If the present rate of duty is retained on tungsten ore and ferrotungsten, it will raise the cost of high speed tool steel from 20 to 25c. per lb. and the selling price by somewhat greater amount.

Need of Classification

"The fundamental defect in paragraph 304, and in several others, is the lack of orderly classification of steel products. The need for more scientific classification has been pointed out by the United States Tariff Commission, and in a brief which the writer submitted to the Ways and Means Committee Jan. 10, 1921 [THE IRON AGE, Jan. 20] he proposed a classification which Doctor Page, of the Tariff Commission, stated was the best attempt in this line that he had seen. Paragraph 304 includes ingots, billets, bars, and forgings, These represent great differences with respect to the ratio of raw material to labor. In the fine steel industry it is possible by the application of labor to convert five cents worth of raw steel in the ingot into 75c. worth of needle wire, or $1.50 worth of safety razor blades, or $10 worth of hair spring wire. It is the highly finished forms of steel representing the expenditure of much labor on a small amount of raw material that are seriously affected by importations from abroad, where labor is so much lower than it is here. About 70 per cent of the duties collected on iron and steel products are on products which are imported in competition with the tool steel industry.

"Instead of adopting an ascending rate of duties on products representing an increased amount of labor, this paragraph contains specific duties, the highest

rate of protection being given to the tonnage products, which have almost no competition from abroad, and the lowest duty is given to the highest priced steels which represent in some cases 85 to 90 per cent labor. If you will examine this schedule you will see that a steel valued at 1½c. is protected to the extent of 33-1/3 per cent, while a steel valued at just under 40c. is given 15 per cent protection, and all steels over 40c. are allowed 20 per cent.

An Important Amendment Suggested

"The defect in the rates in paragraph 304 as applied to high grade steels can be in large measure corrected without complete revision if in line 7 of paragraph 305 you will insert the words "carbon, or" before the word "nickel." Line 7 would then read "containing more than six-tenths of 1 per centum of carbon, or nickel," etc. It so happens that nearly all of the crucible or fine steels are high carbon products running well above six-tenths of one per cent, while the large tonnage industry is in very large part made up of steels running much below six-tenths of one per cent; therefore, if the carbon should be included along with the alloying metals the industry based largely upon the production of high carbon steels would secure the additional protection which it deserves and needs.

"The last portion of this paragraph, beginning at the end of line 13, should be amended so that the additional cumulative duty should apply to the entire molybdenum or tungsten content. Having defined in the earlier portions of this paragraph the lower limit of alloy which shall constitute an alloy steel for duty purposes, there is no reason for setting a different rate at which the assessment of additional cumulative duty shall begin in the case of molybdenum and tungsten. The provision as it now stands will permit the entry of a great many steels containing, in fact, less than 1½ per cent of these elements.

"The additional cumulative duties proposed are of course based upon the exorbitant rates of duty proposed on molybdenum and tungsten ores and metals. If these rates are reduced, as they certainly should be, then of course the additional cumulative duties should also be reduced, and if not reduced it will very seriously injure all the manufacturers of high-speed steel and all of the manufacturers of small tools, such as twist drills, cutters, etc., made from high-speed steel.

"It should further be pointed out that this additional cumulative duty is the same in amount as the cumulative duties placed upon molybdenum metal and ferromolybdenum, tungsten metal and ferrotungsten. It does not take into consideration at all the fact that there is a loss of some 20 to 25 per cent in the use of these metals and ferroalloys in the process of conversion into finished steel. The amount of this loss has been confirmed by the investigations of the Tariff Commission. Therefore, we are not only deprived of the additional cumulative duty on the first 1½ per cent of molybdenum or tungsten contained, but also upon the entire conversion loss in the use of these metals. If the rates are to be retained as they now appear on the ores and alloys, the additional cumulative duty should be increased by 25 per cent, and it should apply to the entire tungsten or molybdeunm content.

"The same applies to paragraphs 307 and 308 as in paragraph 304, namely, that the higher the value of the steel, the lower is its rate of duty. This defect would be in large measure corrected in so far as it applies to the manufacture of tool steel if the amendment proposed in paragraph 305, line 7, is adopted.

"Paragraphs 315 and 316 cover satisfactorily ordinary commercial rods, wire, and cold rolled strip. They do not adequately protect the manufacturer of highly finished specialties in this line, as, for instance, polished drill rods, watch part steel, safety razor steel, either tempered or untempered, tape line steel, pen steel, needle wire and similar products which are turned out by specialty mills and involve a great deal of skilled hand labor. If the amendment proposed in paragraph 305, line 7, is adopted, this would in a measure take care of these highly specialized products."

Wide Strips and Cotton Ties Not Adequately Protected

Severn P. Ker, president Sharon Steel Hoop Co., presented the following on behalf of the independent steel manufacturers:

I would call your attention to the inconsistency of paragraph 313 and its inadequacy as a protective measure. Hoops, bands and strips are rolled from billets and slabs and are commonly rolled in this country up to 16 in. in width as a result of developments in the last few years of wide strip mills. There are several mills that roll up to 18 in. in width. I think, therefore, that hoops, bands and strips should be described to be steel in coils, scrolls, or cut to lengths, 16 in. in width and narrower. Before the advent of these wide strip mills 8 in. probably covered fairly well the production of this class of steel in this country, but with the development of the automotive industry a much wider strip was required and the industry has met that requirement by the expenditure of large sums of money in permanent investments in highly specialized mills capable of rolling, as above stated, up to 18 in. in width. Our own company rolls regularly up to 15 in. in width and down to ⅜ in. wide. We roll in the narrower widths as thin as 23 gage or 0.025 in. thick. In the wide widths we roll:

Up to 8 in.	down to 16 gage, or 0.065 in. thick
Over 8 in. to 12 in.	down to 14 gage, or 0.083 in. thick
Over 12 in. to 15 in.	down to 12 gage, or 0.109 in. thick

The rates of duty on this class of material, as written in the bill, are less than are accorded other products not nearly so far advanced in the process of manufacture, and in which the labor cost is not so high. (See paragraph 304 covering, among other things, ingots, blooms, slabs and billets out of which hoops, bands and strips are rolled.)

Duties Not in Proper Relation

The whole of schedule 3, as it relates to iron and steel in its various forms, names rates of duty that are not only very low but the classification is very broad in some paragraphs and not fully descriptive of the product in other paragraphs, notably paragraph 313. The commodities under this paragraph should have a rate of duty at least equal to the extremely low rates provided for commodities not so far advanced in process of manufacture and in which the labor cost is not so great. I think that no one who believes in the theory of protection will argue that the rates in paragraph 304, or indeed any of the other paragraphs covering iron and steel, are high. The protection afforded by tariff acts, on iron and steel commodities, in all bills since the McKinley bill have been subject to material reductions until the act of 1913. The latter practically affords no protection against foreign competition to this great industry, which was saved from a continuation of the depression which set in during the latter part of 1913 and early part of 1914, only because of the world war. During the first half of 1914 mill order books shrank to a point which necessitated the curtailment of operations and resulted in decreased employment, and only began to fill up during the latter part of 1914 to a point that justified full employment, as a result of the European War, and full employment in this country was only continued until the effects of that conflict had passed. It has been, in recent months, at the lowest rate as to percentage of operation and employment, I think, in the history of this country, and we can only look for improvement as the general conditions of business improve and then, in my judgment, only if our home market is protected for the benefit of our home labor and investments.

New Paragraph Suggested

I think it is necessary to rewrite the description of hoops, bands and strips of iron or steel to meet the actual facts of to-day's production by dropping the limit of 8 in. and by extending the limit to 16 in. in

width and then to give this branch of the industry a rate that will be consistent with the rest of the schedule which, as already stated, is extremely moderate and will result in only reasonable protection against foreign competition. I would respectfully suggest, therefore, that paragraph 313 be corrected to read as follows:

Hoop, strip, band and scroll iron or steel, hot rolled, not especially provided for, 16 in. or less in width, ⅜ in. or less in thickness, valued at 1c. and not over 1½c. per lb., 25/100c. per lb.; valued at over 1½c. and not over 2c. per lb., 41/100c. per lb.; valued at over 2c. and not over 3c. per lb., 55/100c. per lb.; valued at over 3c. per lb., 20 per cent ad valorem; provided that all strip, band and scroll iron or steel wider than 16 in. shall be considered sheet iron or steel, and provided further that barrel hoops of iron or steel, and hoop or band iron or hoop or band steel flared, splayed or punched, with or without buckles or fasteners, shall pay no more duty than imposed on the hoop or band iron or steel from which they are made. Bands and strips of iron or steel, whether in long or short lengths, not especially provided for, 20 per cent ad valorem.

Cotton Tie Duty Out of Line

Paragraph 314 covering cotton ties and baling ties is entirely inadequate as a protective measure. Why hoops of iron or steel 15/16 in. wide x 0.035 in. thick, cut to specified lengths of 11 ft. 6 in., put up in counted bundles, enclosing a buckle for each strip in the bundle, and coated or painted, should take a duty less than that imposed upon similar strips or hoops of iron or steel not so put up, I cannot understand. These bundles are put up in standard weight of 45 lb. each and to-day are selling at $1.30 per bundle at maker's mills, Pittsburgh. The rate provided in paragraph 314 of ¼c. per pound is, therefore, less than 10 per cent ad valorem. The per ton value of cotton ties at to-day's market at maker's mill, Pittsburgh, is $57.77 per net ton, which makes the ¼c. protection $5 per net ton. I think that paragraph should have the rate of duty changed from ¼c. per lb. to 25 per cent ad valorem, if it is to protect the American producer of this commodity. In years past, before the rail rates of freight were as high as they are to-day, cotton ties could be delivered from English or German ports to any South Atlantic or Gulf port for a very much less rate of freight than from the mill of any American producer (except as to the mills located at Atlanta, Ga., and Helena, Ala., within the radius of a very short rail haul). There would be no adequate protection to the industry in the rate as written. Cotton ties in the past have frequently been carried from German or English ports to South Atlantic and Gulf ports practically as ballast or at exceedingly low rates of freight, by ships coming to those ports for cotton or other products for the return cargoes, and this practice will undoubtedly prevail again as the business of the world begins to assume normal relations. With our present excessive rail rates the cost of delivery from American mills to consumers would be so high that it is doubtful if the rate as written in the bill will afford any protection to the American producers of this commodity; and while rail rates must be materially reduced, if business is to go forward, it is not easy to believe that for a long time they will be reduced to a rate equivalent to that in effect prior to 1914.

The above rates are suggested as a very modest protection, provided the American valuation clause is retained in the bill, which clause the industry heartily approves and supports. Without the American valuation clause I am of the opinion that in order to afford any adequate protection to the American industry these rates would have to be raised materially. Indeed, I do not see how without the American valuation clause dumping and improper valuations can be avoided.

Cost of Making and Transporting Sheets

N. H. Abbott appeared before the committee as vice-president of the Wheeling Steel Corporation, and also as a designated representative of the following independent manufacturers of sheet steel:

Alan Wood Iron & Steel Co., Philadelphia.
Allegheny Steel Co., Pittsburgh.
American Rolling Mill Co., Middletown, Ohio.
Apollo Steel Co., Apollo, Pa.
Ashland Iron & Mining Co., Ashland, Ky.
Bethlehem Steel Co., Bethlehem, Pa.
Brier Hill Steel Co., Youngstown, Ohio.
Canonsburg Steel & Iron Co., Canonsburg, Pa.
Canton Sheet Steel Co., Canton, Ohio.
Carnahan Tin Plate & Sheet Co., Canton, Ohio.
Chapman Price Steel Co., Indianapolis, Ind.
Eastern Rolling Mill Co., Baltimore.
Falcon Steel Co., Niles, Ohio.
Follansbee Bros. Co., Follansbee, W. Va.
Labelle Iron Works, Steubenville, Ohio.
Mahoning Valley Steel Works, Niles, Ohio.
Mansfield Sheet & Tin Plate Co., Mansfield, Ohio.
Massillon Rolling Mill Co., Massillon, Ohio.
National Enameling & Stamping Co., Granite City, Ill.
Newport Rolling Mill Co., Newport, Ky.
Newton Steel Co., Newton Falls, Ohio.
Parkersburg Iron & Steel Co., Parkersburg, W. Va.
Reeves Mfg. Co., Dover, Ohio.
Republic Iron & Steel Co., Youngstown, Ohio.
Seneca Iron & Steel Co., Buffalo.
Sharon Steel Hoop Co., Sharon, Pa.
Superior Sheet Steel Co., Canton, Ohio.
Trumbull Steel Co., Warren, Ohio.
United Alloy Co., Stark Division, Canton, Ohio.
Youngstown Sheet & Tube Co., Youngstown, Ohio.
West Penn Steel Co., Brackenridge, Pa.
Whitaker-Glessner Co., Wheeling, W. Va.
Wheeling Steel Corporation, Wheeling, W. Va.

"My brief," said Mr. Abbott, "is restricted to those steel products which are made on jobbing mills or sheet mills only, and to a proposed tariff on imports of similar materials covered by House Bill 7456, schedule 3, paragraphs 307, 308, and 309.

"The sheet steel industry consists of 598 sheet mills and 43 jobbing mills, scattered from the Atlantic seaboard to Wisconsin; the principal production, however, being in the Pittsburgh-Wheeling, Youngstown-Mahoning Valley and Cincinnati-southern Ohio districts. Other large districts of production are Chicago-Milwaukee, St. Louis, Baltimore-Philadelphia-Bethlehem and Buffalo districts.

The combined production of jobbing and sheet mill products was 2,335,000 net tons in 1919 and 3,300,000 net tons in 1920, of which production approximately one-third was galvanized, using approximately 88,000 tons of spelter for that purpose.

"The industry represents a large investment and in 1920 produced 3,300,000 net tons of sheets, employing approximately 42,000 people in the conversion of sheet bars into finished black and galvanized sheets. The wages paid for this conversion—mill labor only—amounted to $80,260,000.

"Comparative tables of statistics of the growth of the industry in recent years are omitted from this brief, because of the abnormal conditions prevailing from 1915 to 1920, inclusive, during which period an unusually large percentage of the capacity of the industry was engaged in making sheets for foreign consumption; as, during that period, the principal foreign competitors were not in position to supply their accustomed percentage of world's consumption.

"Any consideration of a protective tariff as an efficient, practical measure must, at this time, take into consideration the general sub-normal conditions that exist and that, presumably, may be expected to exist for several years in foreign countries; also the effect of low ocean rates from foreign countries against all rail or rail and water rates in this country, from our principal producing districts, to our seaports.

Labor Cost

"Directly and indirectly, not less than 80 per cent of the total cost of producing steel sheets in this country, is the item of labor; but analyzing from the conversion of the sheet bar into the finished common black sheet—not galvanized nor specially finished—the direct labor cost of producing and of repair labor, ranges from 27 per cent to 31 per cent of the total cost of the product. The increase in cost per ton between 1912

and the first quarter of 1921 is shown by the following schedule:

	Actual Average Cost of Labor Producing Common Black and Blue Annealed Steel Sheets, Per Net Ton Year 1912	Actual Average Cost of Labor Producing Common Black and Blue Annealed Steel Sheets, Per Net Ton, First Quarter 1921
Producing labor	$13.28	$22.86
Labor repairs and maintenance	0.43	1.20
Total	$13.71	$24.06

"This is a difference of $10.35, equaling an increase in labor cost over 1912 of 72 per cent. No comparative figures as to similar labor producing costs per ton of product produced, as paid in mills of foreign countries, are available at this time, but a general contrast can be made with Germany, the figures being reduced to United States currency at the now existing rate of exchange, and both figures being as of July 1, 1921, per day.

	Unskilled Workers	Skilled Workers
Germany	$0.88	$1.25
United States	3.00	9.95

(Skilled sheet mill workers in the United States work 5½ days and unskilled 6 days per week.)

"Both English and Belgian rates for similar work are higher than the rates paid in Germany but are very substantially less than the rates paid in the United States.

NOTE.—In connection with the comparison of the wages paid in the United States, as of July 1, it is pointed out that the rates effective at that time were materially less than the average of those existing in 1920. The rate in 1920 for unskilled labor was $5.06½ for a 10-hr. day. The skilled labor rates show a corresponding reduction.

Transportation Costs

"The following comparison is made between the rates from Pittsburgh and comparative ocean rates from the principal shipping ports in England, Germany and Belgium, all per net ton of 2000 lb. Foreign currency rates are reduced to United States currency at now existing rates of exchange.

	From Pittsburgh				
To	All Rail	Rail and Water	From England	From Belgium	From Germany
New York	$7.60	....	$5.40	$4.50	$4.50
New Orleans	10.20	$11.20	5.80	4.60	4.80
San Francisco	33 30	20.17	5.80	5.00	5.40
Seattle	33 30	20.17	10.80	6.60	6.60

"The following is a comparison of difference between the lowest foreign and lowest Pittsburgh rate, per net ton in favor of foreign manufacturers:

To	Pittsburgh Rate	Foreign Rate	Difference
New York	$7.60	$4.50	$3.10
New Orleans	10.20	4.60	5.60
San Francisco	20.17	5.00	15.17
Seattle	20.17	6.60	13.57

"The following comparison shows increase in foreign and domestic transportation rates between 1912 and 1921:

	1912	1921	Increase Per Net Ton
Liverpool to New York	$2.00	$5.40	$3.40
to New Orleans	2.20	5.80	3.60
to San Francisco	5.00	8.80	3.80
to Seattle	7.00	10.80	3.80
(All Rail)			
Pittsburgh to New York	3.20	7.60	4.40
to New Orleans	5.14	10.20	5.06
to San Francisco	19.90	33.30	13.40
to Seattle	19.90	33.30	13.40

"Pittsburgh rail and water combination rates existing in 1912 were not available at the time this brief was written.

"It is apparent that the difference in transportation costs alone would prohibit a buyer on the southern seaboard, and particularly in the Pacific Coast markets, from purchasing at home even though the advantage of quicker service or lowered investments in merchandise stocks would otherwise govern his preference. This difference in transportation costs has existed in the past, but not to the marked extent of today.

"The tariff rates on iron and steel sheets as proposed in House bill 7456, schedule 3, paragraphs 307, 308, 309 provide adequate protection to the industry except to the seaboard territory where transportation costs are so decidedly favorable to foreign manufacturers. This condition may be remedied to a substantial extent by the American valuation plan which is strongly endorsed by the industry.

"The capacity of the sheet steel industry of this country is sufficient to supply the requirements of the United States, as evidenced by any previous year's consumption; and, in addition, to produce a surplus equal to at least 25 per cent of its capacity; also that in the period from 1912 to 1921 the number of mills increased 38 per cent and producing capacity 45 per cent."

Manganese and Magnesite Duties Defended

Speaking for the Lavino Furnace Co., E. W. Marshall, and his own company, Vice-President Radcliffe Romeyn of the American Manganese Mfg. Co., with furnaces at Dunbar, Pa., made a plea for a protective duty on ferromanganese. He said that unless this is granted, the merchant ferromanganese industry will be wiped out of business within six months. The domestic makers, he stated, are satisfied with duties carried in the Fordney bill, or an alternative that would be acceptable would be free manganese ore with either an ad valorem duty of 25 per cent or a specific duty of $15 per gross ton on ferromanganese. This latter figure was arrived at by taking from the duty of $39.42 that would be levied on 80 per cent ferromanganese at the proposed rate of 2-1/5c. per lb., the sum of $24.64 that would be levied on 45 per cent manganese ore at 1c. per pound as proposed, the difference being $14.78. With a $15 duty the domestic maker would escape payment of the $24.64, if the ore duty is eliminated and be granted the same protection as now proposed. At the same time the $15 ferromanganese duty would represent a cost of only $2,250,000 annually to independent steel manufacturers, or 29.9c. per ton increase in the cost of soft steel production. The depressed condition of the industry was cited and the attention of the committee was called to the fact that workmen at Dunbar had voluntarily taken a cut of 22c. per hour in wages in order to continue employment and maintain operations. British competition was assigned as the chief reason for asking protection.

John J. Howard, general manager of the Lavino Furnace Co., after concurring in the arguments of Mr. Romeyn, submitted a brief and made some supplementary remarks. He expressed satisfaction at the action of the House Committee on Ways and Means in giving ferromanganese a classification separate from pig iron and spiegeleisen. Senator Smoot said that it is difficult to make the classification and that he could not understand why ferromanganese manufacture should be given a duty of $15 and spiegeleisen a duty of only $1.25, when both products are made in the blast furnace and contain manganese, though he said he recognized one was much higher than the other in manganese. It was explained to him by Mr. Romeyn, who interposed to clear the point, that standard spiegeleisen runs from 18 to 22 per cent in manganese only, although Senator Smoot insisted it runs as high as 30 per cent, while standard ferromanganese runs to 80 per cent or higher. Spiegeleisen, Mr. Romeyn said, needs no higher protection because there are ample supplies of domestic ore for spiegel manufacture, while foreign ores are necessary for the production of standard ferromanganese.

Mr. Howard said that the domestic makers, if allowed to develop, can produce cheaply enough so that steel makers will not have to buy foreign ferromanganese.

Without making any specific recommendation, George H. Crosby, Duluth, Minn., explorer of minerals,

urged the committee to provide protection for domestic manganese ore. Sharp refutation was made of claims that deposits in the United States are small and isolated and that there is a lack of high grade materials. Stimulation of manganese mining during the war was explained and it was stated that it could be proved that there are 43,000,000 tons of manganiferous ore and over 30,000,000 tons running higher in manganese. To show that the actual tonnage of reserves is greater than has been reported, it was asserted that there are 36,000,000 tons on the Cuyuna range, of 5 to 35 per cent manganese content. The witness said that more than $7,0000,000 has been spent since 1914 in trying to develop manganese mines and that of 39 on the Cuyuna range only two are operating. The belief was expressed that if the industry is protected this country would be capable of producing 75 per cent of the manganese required and would be for many years. The area explored in Minnesota was said to be only one-eighth of the proved merchantable deposits. The ore in reserve inland could be increased to 50,000,000 tons on the Cuyuna range alone, Mr. Crosby said.

Charles W. Potts, of Dearwood, Minn., prospector and miner of manganese ore, made a plea similar to that of Mr. Crosby. He said domestic shipments in 1918 totaled 305,000 tons. Official reports by the Government and States were declared to be out-of-date and reserves to be greater than have been estimated. Mention was made of manganese ore deposits, some as high as 49 per cent, in the Batesville, Ark., district, while others of 31 per cent were called to the attention of the committee. Mr. Potts said he thought there were reserves amounting to 10,000,000 tons, ranging from 40 to 42 per cent in manganese, 20,000,000 tons of ferruginous ore, and 36,000,000 tons of manganiferous ore, and that they will last as long as the iron ore deposits.

American Mining Congress for High Duties on Minerals

That the Finance Committee may give ferromanganese a different classification from that provided in the Fordney bill was indicated by inquiries with this in mind directed to witnesses by Senator Smoot, and the interest he manifested in a recommendation by Herbert Wilson Smith of the American Mining Congress. Mr. Smith pointed out that as the ferro-alloy section is framed it is difficult to make a division between spiegeleisen and ferromanganese and suggested that ferromanganese instead of being classified as "such iron manganese alloys as contain 45 per centum or more of manganese," the content be lowered to the top line of spiegeleisen, or, as Mr. Smith said, 23 per cent of manganese. Mr. Smoot, as he had done previously, insisted that standard spiegeleisen runs up to 30 per cent in manganese, despite the fact that the trade recognizes it as ranging from 18 to 22 per cent. Mr. Smith said at present there is a gap between spiegeleisen and ferromanganese which should be taken up by means of the suggested reclassification. Spiegeleisen, however, in the Fordney bill is described as "an iron manganese alloy containing less than 45 per cent of manganese," or, in other words, is graded up to the point where ferromanganese begins.

Mr. Smith's testimony dealt with 27 minerals and he submitted extensive statistical data on which he based his arguments, some of which were to support suggested revisions and reclassifications. He supported the duty carried on manganese ore, the duties suggested by graphite and zinc producers, also the restoration of the Payne-Aldrich rates of 7c. and 11c. respectively on block and pig aluminum and aluminum sheets and strips. He did not insist on the latter, however, but said the Fordney rates of 5c. and 9c. are as low as the domestic industry can stand. He also recommended that the duty on block tin be increased from 2c. per lb., proposed in the Fordney bill, to 4c. per lb.

Statement of the Northwestern Magnesite Co.

An argument for the proposed duties on magnesite was made by Roy N. Bishop, president and general manager of the Northwestern Magnesite Co., with mines in Stevens County, Washington. He said that while the proposed duty on dead burned magnesite does not now represent the difference between costs of production in the United States and Austria, it is felt that economic conditions in the United States will adjust themselves so that it will be possible to produce more cheaply than has been possible heretofore. He cited the following delivered prices per ton to show the costs in the United States compared with those of Austria:

	Austria	United States	Difference
Chester, Pa. (seaboard)	$20.00	$46.35	$26.35
Pittsburgh	24.50	43.95	19.45
Harrisburg, Pa.	22.80	46.35	23.55
Johnstown, Pa.	24.30	46.35	22.05
Buffalo, N. Y.	24.50	43.95	19.45
Youngstown, Ohio	24.60	43.95	19.35
Chicago*	27.20	43.95	19.35
Cleveland	25.60	43.95	18.35

*Magnesite from Austria takes rate by New Orleans of $7.20 to Chicago.

Mr. Bishop said that not a pound of magnesite had been produced by the Northwestern mines in 1921 so that the percentage of domestic supplies is probably back to the pre-war basis of 5 per cent of the total. This was attributed partly to the depression in the steel industry but also to imports from Austria.

The following table was submitted to show the total crude magnesite produced in the United States for the past four years, according to the United States Geological Survey, and also to show the tons of crude magnesite produced by the Northwest Magnesite Co., and the percentage of the total for the United States contributed by that company. It was given to refute claims that this company had a monopoly.

	Total U. S., Tons	Northwest Magnesite Co. Tons	Per Cent
1917	316,838	62,737	19.8
1918	231,605	81,111	35.0
1919	156,226	89,163	57.1
1920	303,767	141,817	46.7
Total	1,008,436	374,828	37.2

A schedule was submitted to show that the center of consumption is in the Pittsburgh district and surrounding territory, including Youngstown, Ohio, and Johnstown, Pa., with a yearly consumption of 66,000 tons by 415 open-hearth furnaces having a daily capacity of 26,935 tons of steel. The freight rate on magnesite from Chewelah, Wash., is $20.80 per net ton to Johnstown and $18.40 to Youngstown and Pittsburgh. The rates from the Atlantic seaboard were said to be $4.10 to Johnstown, $4.50 to Pittsburgh, and $5 to Youngstown. The statement was also designed to show that there is not enough business west of the Mississippi to justify operating magnesite mines.

The annual consumption in the latter territory was given as 13,550 tons, or 8.5 per cent of the total consumption of dead burned magnesite in the United States. Domestic production, according to government figures, ranged from 12,443 tons in 1910, or 3.7 per cent of the total consumption, to 316,838 tons in 1917, the peak year, or 89.2 per cent of consumption. Some of the conclusions of Mr. Bishop, who strongly upheld the quality of domestic magnesite, were:

The proposed tariff will only add 3c. to 5c. to the cost of a ton of steel, which may be considered negligible.

Five hundred pounds of steel tools for a mechanic would only have its original cost increased 2c., which may be considered negligible.

Magnesite mines only ask a tariff which will place American mines in competition with Austrian mines. It is therefore fair to assume that the importations will equal 50 per cent of the consumption. The steel manufacturers are asking a tariff so that they may accomplish the same end.

With a competitive tariff, assuming 50 per cent of the magnesite enters from Austria, the United States would furnish about 75,000 tons of dead burned magnesite.

The cost of Austrian magnesite versus American magnesite is based upon the following differences

which justify granting a tariff that will place these two countries upon a competitive basis:

	United States	Austria	Difference
Labor, per day.....	$5.30	$0.30	$5.00
Coal, per ton.....	9.00	5.75	3.25
Freight to Chester....	20.80	4.60	16.20
Freight to Pittsburgh.	18.40	9.10	9.30

Competition must exist at the center of the steel industry (Pittsburgh and vicinity) in order to protect American industry, as only 2.6 per cent of the open-hearth steel capacity in the United States is west of the Mississippi. West of the Mississippi there are 129 copper converters which would require only 2.8 per cent of the dead burned magnesite consumed in the United States.

H. F. Wierum, Valley, Wash., general manager American Mineral Production Co., supported arguments in behalf of the proposed duty of ¾c. per lb. on grain magnesite. He stated that his company has 4,000,000 tons in sight, with a probable reserve of 10,000,000 tons more of mineral for the making of this grade of magnesite and said he thought the Northwestern Magnesite Co. has the same quantity of reserves, while California has in reserve at least 1,000,000 tons of material for making plastic magnesite.

While upholding the proposed duty of 10 per cent on graphite, preference was expressed for a rate of 6c. per pound on flake and 2c. per pound on lump by Floyd Weed, of Birmingham, Ala. His contentions in behalf of the domestic graphite producers were similar to those made by George Sharpe, also of Birmingham, representing producers in Alabama, as published in THE IRON AGE of last week.

Vice-President Buck Presents Views of Bethlehem Steel Co.

A brief was submitted by Vice-President C. A. Buck, Bethlehem Steel Co. regarding certain schedules in the tariff bill. His principal points were made as follows:

"We believe the proposed duties on finished steel products in the metal schedule to be fair and equitable to the steel industry in general provided the American valuation plan is accepted. It is only certain raw materials and certain alloys that are practically raw materials that we wish to call to your attention.

Ferroalloys

"We would recommend that only nominal duties be put on ferroalloys and that the ores from which they are made, be put on the free list. Our reason for these requests are:

"1. Ferroalloys are essentially raw materials, being the first product resulting from the smelting of the various ores, this generally being done in the electric furnace.

"2. The ores of most of the metals in this group do not exist in the United States in commercial quantities. As to this feature reference may be made to some of these elements in detail.

Chromium

"Only low grade chromium ores exist in the United States. These occur in California and their use in the steel industry is practically prohibitive on account of their leanness and their cost when the freight on waste matter in the ores is considered. No rich chrome ores were developed during the exceedingly high war prices. The deposits in California are too low grade to be of importance in peace times but would form a valuable emergency reserve in time of war.

Tungsten

"The case of tungsten is much like that of chromium. In using up our tungsten reserves we are consuming a relatively low grade reserve of very moderate tonnage in competition with rich ores of very large tonnage that occur in Peru, China, the Malay States, etc.

Nickel

"No nickel deposits exist in the United States and a high duty on the crude forms of nickel (metallic nickel and nickel alloys) is a hardship on the steel industry.

Manganese Ore and Ferromanganese

"Manganese is absolutely essential in the steel industry and about 17 lb. of ferromanganese are used for every ton of steel produced. This importance makes the subject worthy of special mention. We are not in favor of a duty on manganese ores, but do object to more than a nominal duty on ferro-manganese.

"Inducements should be made in this tariff for the manufacture of ferro-manganese in this country. This can be done by admitting the ores free of duty and by putting a nominal duty on ferro-manganese. In this way we will offset the advantage Europe now has in the matter of ocean transport on ores from India, Turkey and Brazil to European points. England in normal times enjoys a distinct advantage in ferro-manganese production over the United States. Any tariff on manganese ore will increase this advantage.

Fluorspar

"Fluorspar is an essential material in the steel industry being the only satisfactory flux for open-hearth furnaces. For many years a considerable part of our requirements has been imported, mostly from England.

"The tariff on fluorspar will be a distinct hardship on Eastern steel manufacturers on account of the high freight rates applying from Kentucky and Illinois. We believe the reserves in those states to be ample, but also believe that steel plants located in the east will be a distinct disadvantage as compared with Chicago and Pittsburgh. The freight rates at present are as follows: From Ky.-Ill. field to Chicago, $3.60; to Pittsburgh, $5.60; to Bethlehem, $8.00.

"It is to be noted that the American fluorspar industry will apparently flourish without tariff protection. So many new uses are being developed for high grade spar that the industry has greatly expanded in recent years. Thus while the price of spar in 1920 was four times that of 1890, production was about 18 times the production for 1890. This development occurred while fluorspar was on the free list or while it had only a nominal duty of $1.50 per ton.

Magnesite and Magnesite Brick

"Magnesite is an important refractory used extensively in the steel industry for lining open hearth and other furnaces. It is subjected to a dead burning process before use and is then called dead burned grain magnesite. A large amount is used in this form and a large amount is also used in the form of brick made from this material. The only substitute is a very pure dolomite which while cheaper is not as satisfactory as magnesite. The best magnesite for refractory purposes occurs in Austria and the magnesite industry of the United States has practically been built up on importations from that country. As indicating this development the imports of dead burned magnesite were 30,000 tons in 1904 and increased to 150,000 tons in 1914. Development of domestic magnesite has been recent and only one property located in Washington is known that can supply an important tonnage. California also is a producer, but the quality of the product is such that it is not well adapted to refractory use. In 1920 California produced 82,000 tons and Washington 222,000 tons.

"We are not in favor of the imposition of a duty on magnesite for the following reasons:

"1. An important magnesite brick industry has been built up in the East, depending entirely on Austrian magnesite. This industry comprises many brick plants located in Pennsylvania and Maryland and well adapted to serve the steel industry.

"2. Geographically the Washington deposit is such that it will always furnish a product delivered to

(*Continued on page* 564)

Program for Technical Sessions of Convention of American Steel Treaters

The schedule of papers which are to be presented for discussion at the technical sessions of the American Society for Steel Treating at its third annual convention and exhibition at Indianapolis, Ind., Sept. 19 to 24, follows:

Tool Steel

C. M. Brown, vice-president Colonial Steel Co., Pittsburgh: "Tool Steel Specifications."

W. G. Calkins, metallurgist Detroit Twist Drill Co., Detroit: "Notes on Forged High-Speed Milling Cutters."

A. H. d'Arcambal, metallurgist Pratt & Whitney Co., Hartford, Conn.: "Physical Tests on High-Speed Steel."

A. W. F. Green, metallurgist John Illingworth Steel Co., Philadelphia: "Providing Properly Rolled Tool Steel for the Steel Treater."

L. K. Marshall, metallurgist North East Electric Co., Rochester, N. Y.: "Tool Steel Manipulation."

M. H. Medwedeff, metallurgist, 5014 Weseley Avenue, Howard Park, Baltimore, Md.; "Heat Treatment and Uses of High-Speed Steel."

T. Holland Nelson, steel works manager H. Disston & Sons, Philadelphia: "A Comparison of American and English Methods of Producing High Grade Crucible Steels."

L. R. Seidell, managing director New York Testing Laboratories, New York: "Tool Steel."

A. S. Townsend, chief chemist Cleveland Twist Drill Co., Cleveland: "The Effect of Tungsten Content on the Specific Gravity of High-Speed Steel."

Metallographic Research

R. L. Dowdell, instructor of metallography, University of Minnesota, St. Paul, Minn.: "Reclaiming High Carbon Gears."

J. P. Gill and L. D. Bowman, metallurgist and assistant metallurgist Vanadium Alloy Steel Co., Latrobe, Pa.: "Metallography of High-Speed Steel."

N. B. Hoffman, metallurgist, Colonial Steel Co., Pittsburgh: "Ghost Lines and Grain Elongation in Hot Rolled and Cold Drawn Iron Wire."

F. C. Lau, consulting engineer, 1437 W. Jackson Boulevard, Chicago: "The Effect of Phosphorus in Tool Steel."

Heat Treatment of Steel

D. N. A. Blacet, metallurgist Central Steel Co., Massillon, Ohio: "Modern Methods of Heat Treating."

I. H. Cowdrey, professor of mechanical engineering, Massachusetts Inst. Tech., Cambridge, Mass.: "The Efficiency of Annealing Overstrained Steel."

L. S. Cope, consulting metallurgist, 920 Mary Street, Ann Arbor, Mich.: "Coarse Grained Forgings; Their Detection and Correction."

E. J. Janitzky, metallurgist Illinois Steel Co., South Chicago, Ill.: "A Contribution to the Problem of the Influence of Mass on Heat Treatment."

J. F. Keller, department of forging and heat treating, Lewis Institute, Chicago: "The Whys of Warping."

C. B. Langstroth, metallurgist A. O. Smith, Milwaukee, Wis.: "Heat Treatment of Steel."

H. E. Hayward, metallurgist Link Belt Co., Indianapolis, Ind.: "Malleable Iron."

S. L. Hoyt and G. H. Bierman, metallurgical engineers National Lamp Works, Nela Park, Cleveland: "On the Theory of Hardening Steel."

T. D. Lynch and W. J. Merton, metallurgical engineers material and process engineering department, Westinghouse Electric & Mfg. Co., Pittsburgh: "Tests Showing the Effect of High Temperatures on Malleable Iron."

W. J. Merton, metallurgical engineer, Westinghouse Electric & Mfg. Co.: "A Coiling and Heat Treating Plant for Helical Springs."

W. J. Priestley, superintendent of hot metal division U. S. N. ordnance plant, Charleston, W. Va.: "Fracture Test on Steel to Determine Its Quality."

W. R. Ward, metallurgical engineer, Lyells, Va.: "Miscellaneous Heat Treating."

W. H. White, superintendent of melting shops U. S. N. ordnance plant, Charleston, W. Va.: "Heat Treatment of Steel Castings."

J. A. Gann, metallurgist Dow Chemical Co., Midland, Mich.: "Dowmetal and Its Application."

Carburizing

C. M. Campbell, superintendent Pioneer Alloy Products Co., Cleveland: "Do Alloy Carbonizing Boxes Pay?"

H. H. Harris, president General Alloys Co., Chicago: "Design of Heat Treating Containers."

V. E. Hillman, metallurgist Crompton & Knowles Loom Works, Worcester, Mass.: "The Efficiency of Various Mixtures for Cyanide Hardening and the Rôle of Nitrogen in the Process."

W. I. McInerny, foreman heat treatment armor plate, U. S. N. ordnance plant, Charleston, W. Va.: "Carburizing Heavy Sections."

H. Schagrin, chief chemist, U. S. N. ordnance plant, Charleston, W. Va.: "Carburization with Wood Charcoal."

T. G. Selleck, vice-president Gurney & Selleck, 513 Peoples Gas Building, Chicago: "Carburizing."

P. W. and E. B. Shimer, metallurgical engineers, Easton, Pa.: "Cyanamide in Liquid Case Hardening."

S. C. Spalding, metallurgist Halcomb Steel Co., Syracuse, N. Y.: "Comparison of the Rate of Penetration of Carbon into Various Commercial Steels Used for Case Carburizing."

Management

A. E. Bellis, president Bellis Heat Treating Co., New Haven, Conn.: "Shop Management."

A. A. Blue, metallurgist Duff Mfg. Co., Pittsburgh: "A Successful Bonus System Applied to Heat Treating."

J. Walter Bressler, Philadelphia: "System of Records for Metallurgical Departments."

F. C. Langenburg, metallurgist Watertown Arsenal, Watertown, Mass.: (Title to be supplied later.)

E. W. Pierce, metallurgist Maxwell Motor Car Co., New Castle, Ind.: "Buying Steel on Closer Carbon Limits."

C. F. Smart, assistant chief metallurgist, Ingalls-Shepard division Wyman-Gordon Co., Harvey, Ill.: "Steel Is Steel."

W. P. Woodside, superintendent of materials Studebaker Corporation, Detroit: "Organizing Research to Pay Dividends."

W. P. Wood, professor of chemical engineering, University of Michigan, Ann Arbor: "A University Course in Metallurgical Engineering."

H. F. Wood and F. G. Millard, chief metallurgist and superintendent of finishing department Ingalls-Shepard division, Wyman-Gordon Co., Harvey, Ill.: "Production Efficiency in the Heat Treatment of Drop Forgings."

M. H. Medwedeff, metallurgist, 5014 Weseley Avenue, Howard Park, Baltimore, Md.: "Metallurgy in the Modern Shop."

Alloy Steel

H. J. French, physicist Bureau of Standards, Washington, D. C.: "Tensile Properties of Some Structural Steels at High Temperatures."

M. A. Grossman, metallurgist Electric Alloy Steel Co., Youngstown, Ohio: "The Toughness of Alloy Steels as Affected by Their Heat Treatment."

C. M. Johnson, director of research Park Works Crucible Steel Co. of America, Pittsburgh: "Some Alloy Steels of High Elastic Limit, Their Microstructure and Heat Treatment."

G. C. McCormick, assistant metallurgist Crompton & Knowles Loom Works, Worcester, Mass.: "A Discussion of Uranium and Allied Elements."

H. Styri, chief S. K. F. Research Laboratories, Philadelphia: "Heat Treatment of Chrome Steel for Ball Bearings."

J. S. Vannick, metallurgist research laboratory, Department of Agriculture, Washington, D. C.: "Mechanical Properties of Chrome Vanadium Steels."

Properties of Carbon and Alloy Steels

R. M. Bird, metallurgist Bethlehem Steel Co., Bethlehem, Pa.: "Standardization of Methods Leading to Comparative Properties of Alloy Steels."

A. M. Cox, assistant metallurgist R. D. Nutthall Co., Pittsburgh: "Abrasive Qualities of Plain Carbon and Alloy Steel."

H. J. French and W. G. Johnson, physicist and assistant physicist Bureau of Standards, Washington, D. C.: "Effect of Heat Treatment on Mechanical Properties of 1 Per Cent Carbon Steel."

H. A. Holz, president Holz & Co., New York: "Recent Researches on the Elastic Limit."

L. W. Wild, president Wild Barfield Co., London, England: "Influence of Heat Treatment on the Magnetic Properties of Steel."

H. J. French, physicist Bureau of Standards, Washington, D. C.: "Effect of Heat Treatment on Mechanical Properties of Carbon Molybdenum and Chrome Molybdenum Steels."

Heat Treating Equipment

W. H. Bristol, president Bristol Co., Waterbury, Conn.: "Automatic Compensation for Variation of Cold Ends of Thermo-Electric Pyrometers."

E. D. Campbell, professor of chemistry University of Michigan, Ann Arbor: "Some Brinell Hardness Measurements on Small Specimens."

George Keller, sales manager Brown Instrument Co., Philadelphia: (Title to be supplied later.)

R. W. Newcomb, manager Charles Englehard, Inc., New York: "A New Type Automatic Temperature Regulator: Its Application to Heat Treating Furnaces."

T. Y. Olsen, vice-president Tinius Olsen Testing Machine Co., Philadelphia: "Determination of Stiffness of Wire on Sheet Metal."

S. P. Rockwell, metallurgist Whitney Mfg. Co., Hartford, Conn.: "Testing of Metals for Hardness."

C. Upthegrove, professor of chemical engineering University of Michigan, Ann Arbor, Mich.: "Note on the Small Brinell Machine."

Furnaces

T. F. Bailey, vice-president Electric Furnace Co., Alliance, Ohio: "Electric Furnaces for Heat Treating with Automatic Control."

G. R. Brophy, metallurgical engineer industrial furnace Department General Electric Co., Schenectady, N. Y.: "Calite; A New Heat Resisting Alloy."

E. F. Davis, sales manager Celite Products Co., New York: "Construction of Furnace Doors, Lining and Bases."

F. J. Evans, sales engineer Surface Combustion Co., Springfield, Mass.: "High Pressure Gas and Its Application to Industrial Furnaces."

J. T. Gower, Armstrong Cork & Insulation Co., Pittsburgh: "Reducing Conduction and Radiation Heat Loss."

C. L. Ipsen, designing engineer, General Electric Co., Schenectady, N. Y.: "The Electric Furnace as It Affects Overall Costs of Heat Treated Parts."

P. J. Lafore, industrial engineer Boston Consolidated Gas Co., Boston: "The Use of Gas Fired Furnaces for Heat Treating."

G. M. Little, resident engineering division, Westinghouse Electric & Mfg. Co., Pittsburgh: "An Electrically Heated Forging and Heat Treating Furnace."

W. E. McGahey, foreman heat treating large guns, U. S. N. ordnance plant, Charleston, W. Va.: "Heat Treatment of Large Forgings by Oil, Gas, and Electricity."

A. F. Mitchell, superintendent heat treating U. S. N. ordnance plant, Charleston, W. Va.: "A Comparison of Conditions Entering into the Operation of Oil and Natural Gas Fired Furnaces."

J. Weaver Smith, industrial engineer Citizens Gas Co., Indianapolis, Ind.: "Gas Accessories for the Heat Treating Room."

R. E. Talley, chief engineer Geo. J. Hagen Co., Pittsburgh: "Operating Data on Electric Furnaces."

Miscellaneous Topics

A. E. White, University of Michigan, and J. S. Vannick, Bureau of Standards: "Note on Occurrence of Oxides and Nitrides in Boiler Tube Steel."

F. H. Helrigel, metallurgist Motor Products Co., Detroit: "The Heat Treatment of Copper and Brass."

American Pig Iron Association

BUFFALO, Aug. 25.—At the meeting of the American Pig Iron Association held at the Hotel Statler this morning, representatives of more than 20 producers reported a better buying movement. Unanimous reports of increased shipping and larger inquiry in August than any month this year, were heard. The railroad situation was discussed. Likelihood of a strike did not appear to alarm the representatives. President Friend of the association presided. Generally the producers felt that the worst of the depression has passed. None of the interests represented claimed to be selling on any other basis than immediate delivery. The session was brief and in the afternoon the majority of the visitors went to the Orchard Park Golf Club.

Some Increase in Foundry Operation

In their review of the pig iron market, Rogers, Brown & Co., Cincinnati, discuss the situation in the various divisions of the foundry industry:

"The revival in buying during the past two or three weeks east of the Rockies has caused much discussion as to the increase in melt. The steel plants are doing better. For the most part, there is very little improvement in the general gray iron foundry melt. Here and there a foundry reports a real revival and many are taking off a few more heats per week. The accumulation of these increases is not impressive, but is moving in the right direction. There is more demand for malleable castings, with a corresponding increase in malleable pig iron consumption. In the West this is largely due to railroad repair and some little automobile work. The radiator companies and sanitary ware manufacturers are running well. Agricultural implements builders are not showing any improvement. Piano plate foundries are doing better, preparing for the holiday trade. Mine car, mining and oil well machinery manufacturers have been growing quieter during the past 60 days, although now a few who cater to the oil drillers are picking up some business. Undoubtedly the greatest increase in melt during the past few weeks has been noted in the stove industry. Reports from all sections of the country are unanimous on this. A large part of the stoves are being shipped out as completed, while some are stocked for the cold weather demand. From this synopsis it is apparent that pig iron melt is growing heavier."

COMING MEETINGS

September

Iron and Steel Institute (Great Britain). Sept. 5 to 10. Autumn meeting, Paris, France.

National Exposition of Chemical Industries. Sept. 12. Eighth Coast Artillery Armory, New York.

American Institute of Mining and Metallurgical Engineers. Sept. 12 to 19. Fall convention, Wilkes-Barre, Pa. Secretary, F. F. Sharpless, 29 West Thirty-ninth Street, New York.

National Association of Brass Manufacturers. Sept. 14 and 15. Fall convention, Cleveland. Secretary, W. M. Webster, 139 North Clark Street, Chicago.

National Association of Cost Accountants. Sept. 14 to 16. Fall convention, Cleveland Hotel, Cleveland. Session on morning of Sept. 15 on cost methods of trade associations. Offices of association at 130 West Forty-second Street, New York.

American Society for Steel Treating. Sept. 19 to 24. Annual convention and exhibition, Manufacturers Building, State Fair Grounds, Indianapolis. Secretary, W. H. Eisenman, 4600 Prospect Avenue, Cleveland.

Association of Iron and Steel Electrical Engineers. Sept. 19 to 25. Annual convention, Hotel La Salle, Chicago. Secretary, J. F. Kelly, 513 Empire Building, Pittsburgh.

American Electrochemical Society, Sept. 29, 30 and Oct. 1. Fall meeting, Lake Placid Club, Lake Placid, N. Y. Secretary, Prof. Joseph W. Richards, Lehigh University, Bethlehem, Pa.

October

American Manufacturers Export Association. Oct. 5 and 6. Annual meeting, Waldorf-Astoria Hotel, New York. Secretary, A. W. Willmann, 160 Broadway, New York.

Society of Industrial Engineers. Oct. 5 to 7. Fall meeting, Springfield, Mass. Business Manager, George C. Dent, 327 South La Salle Street, Chicago.

National Association of Purchasing Agents. Oct. 10 to 13. Indianapolis.

National Implement and Vehicle Association. Oct. 12 to 14. Chicago.

National Machine Tool Builders' Association. Oct. 18, 19 and 20. Annual meeting, Hotel Astor, New York. General Manager, E. F. DuBrul, 817 Provident Bank Building, Cincinnati.

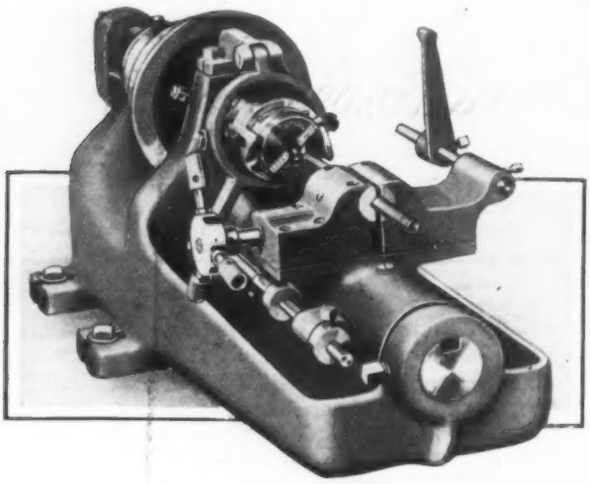
The suit of Capt. Alexander McDougall, shipbuilder, against the Oliver Iron Mining Co., to recover a large amount of royalties alleged to be due on account of infringement on patents on an ore washer, has been decided in favor of the defendant. Captain McDougall may appeal the case to the higher courts.

Building permits issued in Chicago during the first 23 days of August exceeded the number issued for any similar period since 1914. The permits issued numbered 747 and the value involved was nearly $8,700,000.

New Bench Threading Machine

A new bench threading machine for material 1/16, 3/32, 3/16 and 5/16 in. in diameter and cutting 3¼ in. maximum length with one setting, 18 in. with re-settings, has been recently added to the line of the Geometric Tool Co., New Haven, Conn.

The bed is a single casting carrying a spindle mounted on bronze bearings of liberal size. The spindle has three speeds, 653, 333 and 180 r.p.m. and is provided with a Geometric self-opening rotary diehead with



The Carriage Is Guided by a Bronze Key Engaging a Keyway on the Shaft

a yoke lever and trip rod, the operation of which is governed by adjustable stops. The carriage travels on a round shaft and is guided by a bronze key engaging a keyway on the shaft, adjustment being provided for maintaining the proper fit of the carriage on the shaft. This construction of the carriage allows maximum space for removal of chips from the bed. As shown in the illustration, a two jawed chuck is mounted on the carriage which is operated by the handwheel. The adjustable swinging stop on the opposite side of the chuck provides for accurate setting of the work for a pre-determined length of thread. Collets, expanding arbors and special holders can be furnished if desired.

Different sets of chasers are required to cover the threading range of the machine. As in other threading machines made by this company the chasers are removed by tripping the diehead and pulling out the stop plunger, permitting removal from the slots. In replacing, the numbers on the chasers and those on the slots are intended to correspond.

A geared pump driven from the spindle forces oil from the reservoir in the bed through the spindle and against the work. The machine weighs 90 lb. and the bench space occupied is 9½ x 29 in. Mounted on a pedestal the floor space occupied is 16 x 19 in. A 1½ in. driving belt is used, the countershaft pulleys being 3⅞ x 1¾ in., and speed of countershaft 245 r.p.m.

Belgium as a Machine-Tool Market

There are at present only four important plants in Belgium manufacturing machine tools, according to the *Ironmonger* (London), which publishes the following:

Two of these are in Brussels, one in Liège, and one in Bruges. One of the Brussels plants specializes on lathes of 14 to 40-in. dimensions, while the other, which is now increasing its installations to a capacity of 1000 to 1200 a year, builds lathes, milling machines and pneumatic hammers. The Bruges plant, apart from refrigerating machinery, turns out several models of boring mills, which are considered equal to any similar makes produced outside the United States.

The principal export markets for Belgian machine tools are France, Great Britain and Italy. Machine-tool dealers state that before the war 70 per cent of all machine tools imported into Belgium were of German origin. For reconstruction purposes after the armistice, however, American machine tools of all classes were sold in Belgium in large numbers.

While there are in Belgium numerous small shops producing brass valves, the native product is not able to compete with the standardized American article. German competition is particularly active in measuring tools and on small carbon steel articles. In the latter branch German manufacturers undersell American products in the local market by over 80 per cent. It is the local practice to use carbon steel up to ½ in. diameters, and above that dimension to employ high-speed steel. German supremacy in micrometers is almost as exclusive as in drills. A German product, not of extremely high finish, but of entirely accurate construction, is sold in Brussels for 31.20 fr., while the price asked for the corresponding American micrometer is 96 fr.

For Officers of Purchasing Agents' Association

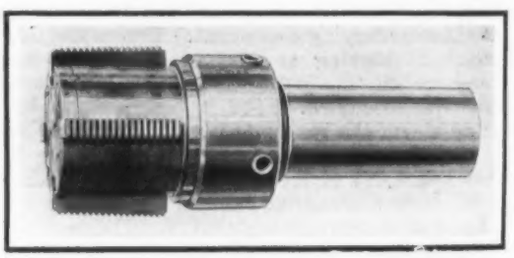
The nominating committee of the National Association of Purchasing Agents has named for re-election the entire board as it now stands. The officers thus renominated include: W. L. Chandler, Dodge Sales & Engineering Co., Mishawaka, Ind., president; S. F. Woodbury, Willamette Iron & Steel Works, Portland, Ore., fourth vice-president; D. E. Ferguson, H. K. Porter Co., Pittsburgh, fifth vice-president; W. J. Gamble, Vulcan Steam Forging Co., Buffalo, treasurer, and L. F. Boffey, 19 Park Place, New York, secretary.

The annual meeting of the association will be held in the Claypool Hotel at Indianapolis, Oct. 10 to 13.

The executive committee of the association at a two-day executive session at Denver passed a resolution advocating centralization of city, county, state and federal purchasing. The resolution states that a saving ranging from 10 to 25 per cent would be effected.

Solid Adjustment Tap

A new threading tool, a solid adjustment tap, has been placed on the market by the Geometric Tool Co., New Haven, Conn. It is intended as an intermediary between an adjustable collapsing and a solid tap, for



Each Size Takes Chasers for a Range of Diameters

use where a machine has no means of closing a collapsible tap or for some other reason does not permit the use of a tap of that type.

While not equipped with the collapsing device the tap is said to have all the advantages of a collapsing tap, and being adjustable, the correct size is always maintained. Each size of tap accommodates chasers for a range of diameters, which are readily removed for grinding. When it is finally necessary to renew the chasers, the new ones can be inserted without renewing the entire tap.

As a memorial to the late Col. Raynal C. Bolling, general solicitor United States Steel Corporation, who was killed in the World War, in March, 1918, his brother-in-law, Dr. J. C. Phillips, Wenham, Mass., has established the Bolling Memorial Redwood Grove on the south fork of the Eel River, in Humboldt County, Cal. A memorial tablet to Colonel Bolling has been placed near the highway at the entrance of the grove. A bronze statue of Colonel Bolling, recently completed by E. C. Potter, the sculptor, is soon to be placed on the Havemeyer School grounds, Greenwich, Conn., as a memorial gift to the town by a number of the colonel's friends.

FEWER ACTIVE MILLS

Sheet and Tube Plants in Mahoning Valley Show Decreased Operations

YOUNGSTOWN, OHIO, Aug. 30.—Indicating slower buying is the reduced finishing mill operating rate in the Mahoning Valley, particularly in sheet and tube mills. Of the 105 sheet mills in the Valley, 45 started on Monday, six less than the previous week, while seven pipe furnaces were fired, as compared with 11 the week before. Of the 66 open-hearth furnaces, 32 are charged this week, as compared with 38 the previous week. But one of the three Bessemer departments in this district, that of the Youngstown Sheet & Tube Co., is active.

Following a three weeks' run, during which accumulated orders were worked off, the Mahoning Valley Steel Co. suspended its sheet plant at Niles this week.

Sheet mills are being operated as follows: Youngstown Sheet & Tube Co., nine; Newton Steel Co., 10; Republic Iron & Steel Co., seven; Brier Hill Steel Co., 10; Sharon Steel Hoop Co., five, and Trumbull Steel Co., four.

The Sheet & Tube Co. is operating four tube mills and the Republic company three.

The Trumbull company is operating 13 tin mills.

Finishing capacity of the Carnegie Steel Co. in this district is engaged to the extent of 35 to 40 per cent.

In the Shenango Valley, the most conspicuous change is in the action of the American Sheet & Tin Plate Co. in operating, for the first time in several months, 20 of its 30 hot mills at the Shenango Works in New Castle on a regular schedule of 16 turns a week.

The volume of new orders combined with releases against former purchases is such as to insure maintenance of production at 60 per cent by the Truscon Steel Co., fabricating interest of Youngstown, Ohio. Road builders and construction interests are absorbing the bulk of the tonnage produced by the company. Current buying is featured by absence of large orders.

Improvement at Milwaukee

MILWAUKEE, WIS., Aug. 29.—The resumption of production by numerous large and small plants in the metalworking industries of Milwaukee and Wisconsin during the past week to ten days has given the general business of this district an aspect which is more favorable than at any time since early spring.

Plant Operations

The New England motor industry outlook is brighter than it has been before in some time. The Stevens-Duryea Co.'s Chicopee, Mass., plant last week resumed full time operations with 500 on the payroll. The company at that time announced a material reduction in prices for its product. The Rolls-Royce of America, Inc., Springfield plant, according to present plans, will reopen Sept. 6. Whether all employees will be taken back at once or a start be made with reduced forces and then gradually increased depends to a large degree on the ability of automobile body builders to furnish the company with finished products. The plant was obliged to close due to the inability of the body builders to furnish bodies built to Rolls-Royce specifications. Announcement is made that the Driggs Ordnance & Mfg. Corporation, New Haven, Conn., will soon begin the manufacture of light automobiles and automobile parts. Progress is being made by the Waltham Motors Co., Waltham, Mass., toward the resumption of automobile production at the former Metz plant. The Hendee Mfg. Co., Springfield, Mass., motorcycles, is operating its tool department full time in preparation for production of spring models.

The Illinois Steel Co., on Tuesday, Aug. 23, reemployed about 800 men out of the total who were laid off April 1 when operations of the Bay View mills at Milwaukee were suspended because of the decline of demand. The blast furnaces so far are not affected by the reinstatement of working forces. Four rolling units are now in operation. The number of men back at work represents about 65 per cent of the normal force.

The Malleable Iron Range Co., Beaver Dam, Wis., on Aug. 26 resumed production in its gray iron foundry department and the malleable foundry may be reopened within a short time in view of the steady improvement in business. Both foundries have been idle since the early part of the year.

The Gurney Refrigerator Co., Fond du Lac, Wis., which closed down July 1, recalled its entire force of 200 employees for resumption of work on Aug. 22.

Manufacturers of farm implements, farm equipment, dairy machinery and supplies, and other agricultural tools, in many sections of Wisconsin, are either broadening the scope of their operations, or reinstating forces in the case of shops which have been idle for from one to four months.

The Union Pacific Railroad shops at North Platte, Neb., have resumed operations, returning about 45 per cent of the old employees to work. The shops had been idle for seven months.

The Powell Pressed Steel Co., Hubbard, Ohio, has resumed operations on a small scale, following a protracted suspension.

British Steel Exports Very Low in July —Imports Increasing

British steel exports in July, this year, excluding iron ore and including scrap, were only 64,001 gross tons as compared with 183,373 tons per month for the first quarter and 368,481 tons in July, 1920, or the heaviest in that year. The average per month in 1913 was 420,757 tons. The July outgo is much less than even the 1919 monthly average and smaller than any month in the war years. Imports in July were 103,561 tons, which contrast with 88,083 tons in June, and with 186,040 tons per month in the first quarter. The 1913 imports were 195,264 tons per month and in 1920 they were 128,685 tons per month. The following table shows comparative data:

British Steel Exports and Imports

Gross Tons	Exports	Imports
Aver. per mo. first quarter 1921	183,373	186,040
April, 1921	161,508	111,536
May, 1921	101,202	89,348
June, 1921	66,301	88,083
July, 1921	64,001	103,561
Aver. per mo. second quarter 1921	109,670	96,320
Aver. per mo. 1919	188,519	50,801
Aver. per mo. 1920	274,881	128,685
Aver. per mo. 1913	420,757	195,264

The trend of some of the principal exports is shown by the following data in gross tons:

Principal British Exports

	Average per Month 1913	1920	July, 1920	July, 1921
Pig iron	78,771	38,505	49,205	7,777
Steel rails	41,676	11,213	23,963	1,581
Steel plates	11,162	16,571	22,787	2,680
Galvanized sheets	63,506	34,244	51,214	2,691
Steel bars	20,921	30,322	48,818	2,702
Tin plates	41,208	29,418	32,616	8,827
Black plates	5,679	3,026	2,225	500
Steel sheets	....	....	12,607	779

Iron ore imports in July were only 14,857 tons as compared with 541,742 tons per month in 1920. In July, 1920, they were 641,975 tons. The total for the first seven months was 1,299,023 tons, as compared with 4,101,483 tons in the first seven months in 1920.

Manganese ore imports were only 4789 tons in July against 37,717 tons per month in 1920 and 50,098 tons per month in 1913. The total to Aug. 1, this year, was 146,827 tons against 225,589 tons for the same seven months last year.

Oil well supplies, accessories and tools, including drilling outfits, are wanted in the Argentine Republic, according to the United States commercial attaché in Buenos Aires. Manufacturers are asked to send two copies of their catalogs to the Bureau of Foreign and Domestic Commerce, Washington, for transmission to the Direccion General de Petroleo. One inquiry covers 12 pipe-cutting machines of various sizes.

HOPES NOT REALIZED

Little New Business in the Valleys—Controversy as to Price of Basic Pig Iron

YOUNGSTOWN, OHIO, Aug. 30.—Relatively small unfilled tonnage of district iron and steel makers is being rapidly worked off, with some additions to stock material, while incoming business is hesitant and insufficient in volume to maintain operations at the rate which prevailed the first three weeks in August. The hoped for revival in buying this fall will likely fall short of expectations and there is considerable pessimism in the trade, especially in view of low current prices as compared with costs.

A controversy has arisen with respect to the actual price of basic pig iron, which some steel works interests maintain they have advanced to $20, from $18. Several large consumers, on the contrary, insist that the $18 price is still current and that iron is purchasable at the lower figure. One substantial buyer states that iron has been bought at $18 since the reported advance by certain Valley makers. This interest points out the inconsistency of a higher iron market in view of recessions in prices of important finished products, such as sheets.

The Reduction in Sheets

Reductions in prices of sheets met by the leading interest have established the market at 2.25c. for blue annealed, 2.75c for No. 28 gage black and 3.75c for No. 28 galvanized. Some galvanized tonnage has been offered at 3.70c., it is understood. The relatively low price of galvanized is partially due to the fact that spelter has sagged to 4.15c per lb., a level that it has not reached in a number of years.

All sheet business, for the present, is confined to small tonnages, though business is coming from more diversified groups than formerly. In both sheets and pipe, jobbers are active factors in the market. Interest in galvanized sheets shows more life, owing to seasonal requirements from Southern buyers. Full finished sheet buying is still holding up, virtually all of the demand coming from the automobile trade. Weakening in the price of No. 22 gage auto body stock is noted, following declines in other grades, and some interests are now quoting 4.45c on the material mentioned, as compared with 4.70c, the quotation which prevailed for a considerable period.

Plates Still Weak

Plates continue to be the weak spot of the market in this territory, with one mill of the leading independent working off light gages. Other plate mills in this territory operate spasmodically on skelp, while the Youngstown Sheet & Tube Co. has been out of the plate market for an indefinite period. The price range is from 1.70c. to 1.75c. The only recent order of consequence involved in excess of 600 tons was placed in a nearby district.

Demand for wire products has been more sustained than for some other finished commodities, and prices have been firm at $2.50 for wire and $2.75 for nails. Some wire rod tonnage has been moving at $42.

Hot strip demand continues one of the brightest spots on the market, maintaining production of the leading maker at 60 per cent. Cold strip is also being rolled, all of the output going to automobile builders, and chiefly to the Ford Motor Co. The price is fairly established at 2.25c. for hot strip and 4c. for cold rolled.

Standard pipe is in fair demand from jobbing quarters. Increased uses of pipe in the smaller sizes are being reflected in the diversity of inquiry. Lap weld is largely listless, though some tonnage is being rolled for export to oil interests in Mexico.

The sheet bar market is more firmly established at $30, since the cut in sheet prices. About the only tonnage moving is against contracts, and going to non-integrated makers of sheets.

Whether it is a sustained movement or not, old material is still firm. A recent sale of heavy melting involving 1000 to 1500 tons was closed at $14. A sheet maker operating open-hearth furnaces has taken a small tonnage of hydraulically compressed scrap at $11, though dealers maintain that $12 more fully represents the market. While consumers' stocks are generally lower due to recent enlarged operating activity, they are still far from depletion. Scrap is generally being offered less freely, as it is being made in smaller quantities.

BUSINESS IN PITTSBURGH

Replies to Questionnaire Indicate That a Hopeful Feeling Prevails

The Trade and Industrial Bureau of the Chamber of Commerce of Pittsburgh, with an idea of determining the state of business in the Pittsburgh district, recently distributed 1000 questionnaires into various trade channels containing the following questions:

How does present volume compare with April? (A questionnaire was sent out last spring.)
Are inquiries more numerous?
Do you receive a larger percentage of orders from inquiries than you did during the last quarter?
How are collections?
What in your opinion are the prospects for increased business in the next six months?
How does the present number of employees compare with April?
Do you believe we have made the turn?

In a summary of the replies, *Pittsburgh First*, organ of the Chamber of Commerce, says:

"According to answers business is not very good. That is the net summary of what business has been during July and August. As to what is in store, that is a different question. Many are frankly convinced that we have made the turn and that business will grow better during the autumn. A minority report that they do not expect anything like a real resumption of business until spring. Analyzed, the answers show the effect on different industries and lines of merchandising. Some industries are faring better than others. A few even have as many employees as they had several months ago—and this in spite of the wave of unemployment. Several show such wide variance in their outlook on future business conditions that there is no way to strike a happy medium. It all depends on whose ox is gored, apparently. Wholesale lumber may react the same as retail lumber, in the main, but the two are far different from wholesale groceries, from chemical manufacturing, from the making of iron and steel, or from the sale of automobiles. The coal industry, which has long been dormant, shows renewed activity as September approaches, but coal men deny anything more than the usual fall spurt.

"One of the most outstanding points made by the answers is that on the whole collections are satisfactory. In a number of lines they are reported slow, but the majority report them either 'fair' or 'good.' Coming at a time when many business firms are or have been refusing to take advantage of discount for cash, this seems to indicate that money is loosening up.

"A report by one industry or one concern might not indicate much as to general conditions, but when 1000 answers are grouped, the composite report is important. As an indication of what Pittsburgh business thinks of business to-day and to-morrow, the result is eminently satisfactory. There is no reason for premature optimism; so many concerns are marking time. But there is real cause for optimism in the attitude of the majority of concerns toward the immediate future. With scarcely an exception the belief is expressed that 'we have made the turn,' that the bottom has been reached and that an upward trend may be expected. A few profess to believe that only in finance has the turn been made; that the labor situation still is to be solved. But others, basing their statements on wage cuts in many lines of industry during the last few

months, ignore the fact that thousands are still out of work, declaring that the readjustment is now possible and will not much longer be delayed."

New Cylindrical Plug and Thread Gages

The cylindrical plug reversible end gages and the reversible end thread gages shown in the accompanying illustrations are recent additions to the line of the Pratt & Whitney Co., Hartford.

The cylindrical plugs are machine lapped by a modification of the Hoke process which is said to produce a finely finished surface entirely free from circular grooves. It is further claimed that the gages are round and of uniform size from end to end; the measuring machine, fluid gage or amplifying machine showing no errors in these respects. The use of carefully selected alloy steel together with exceptional finish seems to justify the belief that the gages will maintain their accuracy for an unusual length of time. The "go" ends are held to a very small *plus* tolerance from the marked size, to allow for wear. The "no go" ends are held to a still smaller *minus* tolerance, as they are subject to little wear and must accept work which is exactly up to the allowable limit. Blanks are well seasoned before lapping and sizes are marked on the gage end instead of on the handle.

Plugs Are Machine Lapped by Modification of the Hoke Process. View to left shows the two forms of chip groove used in thread gages shown above

The handles are of hexagon stock, giving ample space for marking tool and operation numbers. The method of fastening the ends to the handle is unique. Three prongs on the handle, of 90 deg. included angle, engage three grooves of 75 deg. included angle in the gage ends. By means of a single screw through the gage the wedge-like prongs are forced into the grooves, providing a self-centering tripod support which, it is said, can neither rock nor shake to destroy the sensitiveness of the feel. No locking screws, keys or pins are necessary, the rigidity being practically that of a solid gage. The sizes available are 5/16 to 2 in. Cylindrical gages smaller than ⅜ in., lapped by the same method are in preparation and also sizes larger than 2 in., made hollow for lightness, with the same reversible features.

The reversible thread gages are from the same alloy steel blanks as the cylindrical plugs in all sizes above ½ in. "No go" and "go" ends are interchangeable with the cylindrical plugs and either length can be used according to the preference for long or short threads. For fine pitches the short gages are recommended. Rigidity between gage and handle, insuring sensitiveness of touch, is said to be fully accomplished by the tripod support, previously described.

In the accompanying illustration, beginning at the left the first two gages are the standard type, single and double end. The third gage is a "protected master," which cannot be screwed into a hole, thus impairing its accuracy, being used as a standard for checking thread plug gages, transferring by wires in the measuring machine or micrometer, etc. The fourth is a setting plug which is used for setting thread gage templets. The threaded end is made to duplicate the thread in the templet, while the plain end is used for checking the root diameter. The remaining gage is a non-reversible type, being used for sizes ½ in. and smaller and for larger sizes where the reversible feature is not desired. The handle is of cold-rolled hexagon steel and the gage end of alloy steel. The two parts are driven together on a slight taper and cannot work loose nor shake. A feature of the reversible thread gages is the chip groove provided for carrying dirt and chips ahead of the gage when entering the hole. Two forms are used, as shown in the separate illustration, the one at the right having the first thread removed to form a pilot of root diameter. This is intended to assist in entering the gage when applied to running work or when the gage is held in a reversing speed lathe and the work fed on it, while running.

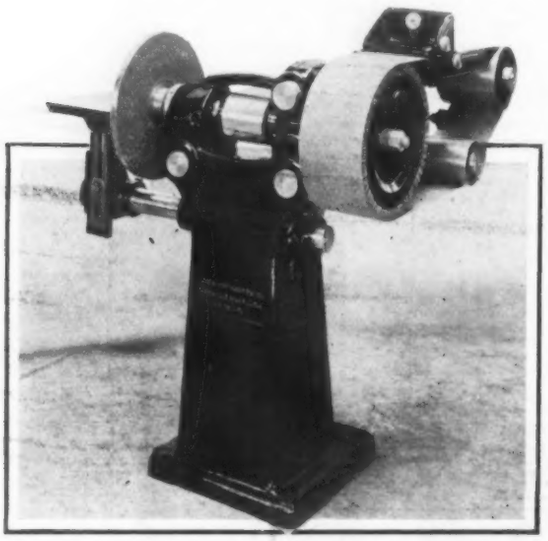
Bids on Hangar to Be Received Sept. 15

WASHINGTON, Aug. 30.—Steel producers and fabricators are greatly interested in bids to be opened Sept. 15 and being asked by the construction division of the War Department for a hangar, gas holder, power house and roadway at Belleville, Ill., as stated briefly in the St. Louis market report in THE IRON AGE, Aug. 25. The hangar will involve 4000 to 5000 tons of steel, mostly shapes, with a good sized tonnage of corrugated sheets and a small quantity plates and bars. The exact number of bays is to be determined upon the price asked for the work, which construction division contemplates letting to a general contractor, who will erect the complete plant. The gas holder will require a fair tonnage of plates. The general contractor is to sublet awards to steel producers, fabricators, etc. The hangar will be next to the largest in the United States, the latter being owned by the Navy at Lakehurst, N. J. It is proposed that the Army hangar, if the price is within the appropriation of $1,000,000, will be 810 ft. long with a 150-ft. arch.

Utility Grinding and Polishing Machine

A utility machine, designated as type R, combining several types of grinding and polishing machines has been recently brought out by the Production Machine Co., Greenfield, Mass. It is principally for disk grinding, polishing and belt surfacing but can also be converted into a buffing machine with double spindle and a single or double wheel tool or a light snagging grinder. It is arranged so that three operators can work simultaneously without interfering with one another.

As shown in the accompanying illustration, one end of the spindle is equipped with a double-faced disk for disk grinding, the other end carrying a patented leather cushion wheel, which is 14 x 6 in. and carries a 6 in. x 7 ft. endless abrasive belt having a surface speed of



The Wheel with Belt Is Used for a Variety of Polishing

4764 ft. per min. The wheel with belt can be used for a variety of polishing. The belt is kept under proper tension by a swinging idler and a quick adjustment for tracking the belt is provided. The spindle is mounted in Timken roller bearings that are packed in grease and sealed from dust and runs at 1300 r.p.m. Adjustment for wear is provided by a simple threaded sleeve and nut.

A table, 6½ x 14 in., is also furnished for surfacing, as well as an adjustable gage to handle articles with straight and beveled edges on the surfacing table, so hinged that it may quickly be swung over to the back of the machine when it is necessary to change the abrasive belt. The idler arm is arranged with a latch so that it may be lifted off the belt and held in place while changing the belt. The disk grinder is 15 in. diameter, and is double faced and reversible. A plain table, 9¾ x 8 in., is supplied, which has a rocking seat to provide for bevel work also adjustment vertically and a circular adjustment on the holding post. Four posts are provided, two in the front and one on each side of the machine, adapting it for the application of a variety of fixtures.

The floor space occupied is 37½ x 36 in. and the height, 46 in. The machine is belt driven, requiring 3 hp. and the driving pulley is 4½ x 4½ in. The base and head are one casting, providing rigid support for the spindle and bearings.

Employment in St. Louis District

ST. LOUIS, Aug. 30.—The Eighth Federal Reserve Bank has received replies from questionnaires addressed to 173 leading employers of labor in 21 of the largest cities of that district, with a normal complement of 90,047 workers, asking for employment data developed that the number of employees of the reporting interests decreased 23,649 or 26.6 per cent between the dates July 1, 1920, and July 1, 1921. On July 1, 1920, the number was 954, or 1.05 per cent under normal, and on July 1, 1921, the total was 24,603 or 27.4 per cent under normal. Wages, figured on a semi-monthly basis, decreased $1,016,592, or 23.5 per cent between July 1, 1920, and the same date this year. The district comprises Indiana, Kentucky, Tennessee, Mississippi, Arkansas, eastern Missouri and southern Illinois.

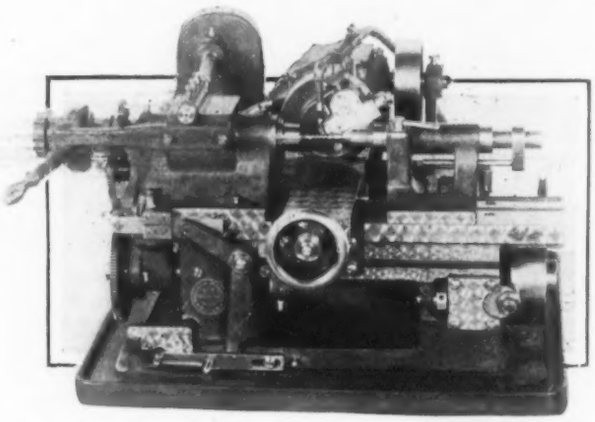
Automatic Thread Milling Machine

An automatic thread milling machine intended for manufacturing purposes and designed to be equipped for a variety of work has been placed on the market by the Waltham Machine Works, Waltham, Mass. Its automatic features not only increase production per machine, but for some kinds of work permit one operator to handle two or more machines.

In operating, the work is first placed in position, either on centers or in the chucking device. The machine is then started by a lever at the left. Further operations, which include the movements of feeding the cutter to the work, the milling of the thread, the withdrawal of the cutter after the required length has been milled, the returning to the starting point, and the stopping of the machine, are automatic. For multiple threads the operations are continuous until all threads have been milled.

The length of the thread is the same as the amount of rise of the cam controlling the workslide, while its pitch is determined by the relation between the gearing from the workhead to the cam shaft and the lead of the work slide cam. Indexing for multiple threads is obtained by a fractional proportion in the gearing, possibility of error being eliminated inasmuch as the workhead continuously revolves in the same direction and there is no backlash to produce inaccurate spacing. The extreme travel of the workslide is 2 in. Threads of this length or shorter may be milled but adjustments are provided so that this milling can be done either close to the work spindle or in any position not more than 6 in. distant.

The approximate location of the cutter slide in relation to the workhead is obtained by moving the cutter



For Multiple Threads the Operations Are Continuous Until All Threads Have Been Milled. By a slight change of design helical gears can be cut

slide support along the tongued ways, while the exact location is obtained by adjusting the work slide cam attached to a slide on the front of the machine. With the exception of the oil pump the whole mechanism is driven by a single belt. The machine can be installed either on a bench or a cabinet base. The cutter spindle and its drive are of the same design and size as used on the company's thread milling machines. The cutter head is provided with an angular adjustment of 45 deg. each side of the horizontal. The workhead is driven by means of a geared connection and universal joint. It is of hardened steel, has a spring collet and is provided with a lever closing attachment.

The machine can be stopped automatically at the end of one revolution of the cam shaft or after any predetermined number of revolutions. The machine shown in the illustration is particularly adapted for cutting multiple threaded worms such as used in phonographs, electric fans, vacuum sweepers, etc. By a slight change in design it can be made to cut helical gears. For brass work the all-gear drive is omitted and a special high-speed belt-driven cutter head provided.

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A. I. FINDLEY WILLIAM W. MACON GEORGE SMART

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Progress in Steel Making

As the steel industry has no occasion to add new capacity at this time and is unlikely to have occasion for several years, it is interesting to speculate what it will do by way of making progress. It is inconceivable that it should stand still, for it has capital, brains, energy, a future and a sanguine temperament.

While there have been great improvements in processes and equipment throughout the history of the steel industry, the most impressive progress has been in the ability to get out tonnage. The capacity in ingots doubled approximately from 1900 to 1910 and again from 1910 to 1920. Prior to about 1900 the steel industry grew, partly through replacement of wrought iron, and the doublings were more rapid, approximately from 1881 to 1886, five years, from 1886 to 1892, six years and from 1892 to 1900, eight years. From 1880 to 1910 pig iron production increased almost precisely by the rate of a doubling every ten years, on an average. From 1910 to 1920 the rule of doubling did not operate, partly because the requirements of iron foundries did not maintain the necessary pace.

For some years it has been a common saying that the steel industry would now have to "go in" for quality, and as often the requirements in common ordinary steel have grown so rapidly as to prevent the finer grades from making an important percentage showing. Perhaps, however, the application of engineering to the filling of man's requirements has now reached a point where the big things, simply on account of their bigness, will require special steels as the little things have often done hitherto. The proportion of weight of structure to load to be carried has been increasing, making it more and more important to minimize the weight of structure.

There is nothing like comprehensive information as to the proportion of steel made in the past few years that was really "special" in character, but the tonnage reported as "alloy steel" is somewhat suggestive. Of the total reported production of steel ingots and castings, "alloy steel" was 2.54 per cent in 1912 and 3.94 per cent in 1920. Such proportions are certainly low. The competition between heat treating and alloying is already rather keen.

It is interesting to speculate whether the steel producers will be disposed in the next few years to try to improve their position by carrying their products to a greater degree of finish. In the past this tendency has appeared to an extent, and there has also been a tendency to "diversify" products by adding to the number of ordinary rolling mill products made. The one may be referred to as "vertical" expansion and the other as "horizontal" expansion, just as in financial affairs there has been "vertical integration" and "horizontal integration."

One large steel producer or another makes bolts and nuts, turn buckles, spikes, cold-finished steel bars, freight cars, ships, rivets, guns and steel derricks and drilling rigs. Other steel makers have been disposed to avoid such vertical expansion, partly because they feared they would be getting into a sort of retail business and partly because they regarded such expansion as in the nature of competition with their natural customers. However, we have passed into a period in which competition by efficiency will be the rule and in which even small orders will be desirable.

Prices and Pig Iron Output

The recent moderate improvement in demand for pig iron and the checking of the downward tendency in prices have caused some furnace operators to consider carefully what prices it will be necessary to obtain to justify the blowing in of merchant stacks. Certainly the country cannot continue indefinitely at the extremely low rate of pig iron production which has been recorded for several months. A daily output of less than 5000 tons by merchant stacks is pitifully small for this great country. It is, of course, a fact that steel companies have been an important factor in the pig iron market, not only in disposing of stocks of steel-making irons, but also in manufacturing foundry grades; but with the gradual reduction of stocks at steel works and with pig iron production at these plants down to 23,000 tons per

day, there is a limit to their control of the pig iron market.

In January, 1913, basic iron was selling at about $16, Mahoning or Shenango Valley. According to the estimate of one important company, producers would now need to ask $26 in order to have the price bear the same relation to cost as $16 had to cost in 1913. It is agreed that the $18 price for basic, which has recently prevailed, will not justify the blowing in of any furnaces, nor will somewhat higher prices, say $19 or $20, on foundry irons. Manufacturers of basic iron estimate that if freight rates on their raw materials were reduced 20 per cent, if Connellsville coke could be obtained at $2.75 and if the price of iron ore could be reduced about 75 cents, basic pig iron could be produced in the Valleys at about $20. It is not likely, however, that freight rates will be reduced in the near future, or that ore prices will be marked down. Hence it will hardly be possible this year to manufacture pig iron, and come out even, at a price at all attractive to melters.

Idle furnaces are not likely to be blown in unless their owners can see a prospect of making a fair profit. Finishing mills often find it desirable to maintain their organizations and keep their customers satisfied, even when, by so doing, losses are constantly recorded. Operators of blast furnaces do not feel the same necessity of maintaining organizations or catering to their customers, and when furnaces are once out they seldom resume unless business justifies. The prospect of materially increasing the production of merchant pig iron this year, therefore, is not encouraging.

Alloy Iron Castings

Recent metallurgical developments point to the growing importance of alloy iron castings for industrial use. The unusual properties which a nickel content of 5 per cent bestows on iron castings was discussed in THE IRON AGE one week ago. Electrical resistance castings containing 4 to 5 per cent nickel, have not only marked electrical properties, but the castings can be "twisted into various shapes, taking a permanent set without breaking." On other pages of this issue the results of German experiments on iron castings containing nickel and cobalt are given, showing that a nickel content of about 1 per cent bestows valuable properties, the cobalt however playing no rôle as an alloy.

Attention has been called recently to the influence of a small percentage of nickel and chromium in chilled cast iron wheels, and this may take on more importance. A large motor corporation is now making iron castings in the cupola, having a nickel content of 1 to 1.5 per cent. The nickel is introduced into the charge as shot nickel in the cavity of rejected pistons. The castings so obtained are harder and wear better than the ordinary gray iron castings.

The use of Mayari pig iron in the making of certain grades of castings is not new. Such nickel-chrome iron castings have proved satisfactory for rolls and for conditions where wearing quality is a factor. It appears that the mixture of this native alloy pig iron with other iron for certain motor castings has proved satisfactory because of sounder metal and a comparatively longer life. Extensive experiments are now being made in order to learn all the possible uses to which this particular class of alloy iron castings can be put. Valuable information should result.

These facts point to the place which alloy iron castings are likely to take in the future. While some of these castings can be produced in the cupola, the electric furnace is necessary in cases where the alloy content is high or a high temperature is required for pouring. It is safe to expect that, with the aid of the electric melting furnace and possibly the application of heat treatment, other metals besides nickel and chromium may be added to cast iron with good results and that alloy iron castings may establish themselves alongside alloy steel castings.

Scrap Prices and Supplies

Were it not that dirt is an expensive thing to have when it is necessary to pay a railroad to haul it away, it might be said that some grades of iron and steel scrap are now "as cheap as dirt." Steel turnings have been sold in Detroit at as low as 50 cents per ton, the seller being required to load on cars, but if the producer had found no purchaser he would have had to pay a railroad to dispose of the material. In either case, however, the scrap would not be paying for its disposal.

Such scrap is at a double discount, a time discount and a place discount. With the great increase in freight rates on scrap the place discount on all scrap is much greater than formerly. The time discount is much greater on turnings than on heavy melting steel, since the turnings rust very rapidly. The average dealer will not stock turnings, while he will stock heavy melting steel. Indeed, most dealers began stocking the latter when it cost $5 a ton more than it has cost recently.

There used to be interested discussion as to whether the supply of scrap would continue to be sufficient for an economical operation of the open-hearth steel industry. Without scrap, or with a small proportion of scrap, there would be a double increase in the cost of making steel, from the higher average cost of the material used and from a lengthening in the time necessary to finish a heat. Year after year, however, the steel industry seemed to get along nicely. Prior to 1904 the production of basic pig iron was about 45 per cent of the production of basic open-hearth steel ingots and castings, pointing to a scrap use of about 55 per cent. Then pig iron rose steadily, to a maximum of about 60 per cent in 1909 and 1910, indicating about 40 per cent for scrap. The trend has since been upward for scrap, since 1920 showed 53.3 per cent as much basic pig iron made as basic steel. The showing is not altogether conclusive, for there was an extra supply of scrap on account of the war, but on the other hand stocks of basic pig iron undoubtedly accumulated, to at least a small extent, toward the close of the year. Still, it seems fair to conclude that without these influences the basic steel of 1920 would have been made with a larger percentage of scrap and a

smaller percentage of pig iron than was the case ten years earlier, although the tonnage output had more than doubled.

What of the future? We are coming into new conditions. For the nearby future there is likely to be a shortage of scrap at the time when production of steel increases sharply. That is generally the case at such a time. An increase in industrial activity brings a demand for steel before it dumps much scrap into the situation, while little scrap accumulates in a period of low industrial activity, because the consumption of steel is confined largely to channels that are not good scrap producers. The steel works individually may feel that they have insurance against a shortage, in the piles of scrap the dealers have been accumulating, but too many steel works may have their eyes on the same pile.

In the long run, two factors are likely to operate to help maintain the supply of scrap relative to requirements. There is always, of course, the works scrap and the industrial scrap, a practically fixed percentage of the steel that is being made. As to old material, its outcome depends on two factors—the length of time steel stays in service and the production at the time it went into service. As industry develops, the time in service is likely to shorten rather than lengthen, while as the steel industry will increase in tonnage less rapidly in future than it has in the past there is aid in that respect. Assuming convenient figures merely to make the argument simple, if the steel constituting the bulk of the returns in scrap form stays in service 20 years and production of steel doubles in ten years, thus making a quadrupling in 20 years, the outcome of old material would be in relation to one-fourth current steel production; but if the doubling of steel requires 20 years the relation is one-half instead of one-fourth. Both the influences named are subject to change and their relation in the future is a matter of no little interest.

An impressive exhibit of the low level to which world demand for iron and steel has fallen is furnished by the July export statistics for Great Britain and the United States. Details of the former appear elsewhere, while facts regarding the latter were analyzed in last week's issue. British July exports totaled only 64,000 gross tons, a smaller movement than at any time of which there is definite record. American exports fell to 86,500 tons in July, which is also smaller than in many years and is in sharp contrast with the record of over 400,000 tons per month only last year. In 1913 the combined iron and steel exports of the two countries were about 655,000 tons per month; in July, this year, they were 150,500 tons, or less than one-fourth as much. Even the combined exports of France and Belgium in 1913, 177,000 tons per month, exceeded the record last July of the American and British industries. If July marked the low record in steel and pig iron output, as now seems likely, it is probable that August will show a slight improvement in the steel exports of both countries.

Wage Reductions a Buying Factor

Manufacturers in some industries are making inquiries for new equipment, looking to the time when their products will be again in active demand. Especially is this so of equipment requiring a considerable time to build, which is often the case with machinery the design of which departs from standard lines. Inquiries for metal-working machinery, excepting of very special character, are not being made to the same extent as for textile machinery, for example, and equipment for producing the thousand and one things entering into the daily life of the people.

The would-be purchaser is keenly alive to the matter of price, and not least in his investigations of the market comes the question whether the machinery builder has cut adequately the wages of his workers. Not all plants have reduced wages. Some firms which have only a few men on their payrolls have taken no action in the matter, putting it off until they shall begin to hire men again. In other cases, quite exceptional however, shops are busy and managers have considered it their best policy to let the payroll remain without change. On the other hand, the managements of some relatively busy shops have made the same reductions as their less busy neighbors, beginning with company officers and going down the line, realizing that prices must come down if new business is to be booked now or later, and that cost of production must fall correspondingly.

In any case, the prospective customer is watching the price lists of the equipment manufacturers, and taking into account, before placing orders, whether the manufacturer has done what he should in reducing costs. Consequently pointed inquiry is common enough, a familiar question being: "What have you done in the reduction of your labor cost?"

Wages of Iron Workers Reduced

YOUNGSTOWN, O., Aug. 30.—Average sales price on shipments of bar iron from mid-Western mills in July and August was 1.85c. per lb., as disclosed at the bi-monthly examination of sales sheets Aug. 29 between representatives of the Western Bar Iron Association and the Amalgamated Association of Iron, Steel and Tin Workers. The average price two months ago was 2.30c.

For the September-October period, the boiling rate will be $9.12 per ton, as compared with $11.38 the previous two months. Wages of bar iron finishers will be reduced 19 per cent by the settlement.

Under the new annual wage agreement, the puddling rate is $1.14 per ton lower at the 1.50c. card, which accounts for part of the reduction. The current boiling rate compares with $18.76 paid the first two months of this year.

Examination of sales sheets to determine the tonnage rates to be paid sheet and tin plate workers in September and October will take place about Sept. 10. Inasmuch as the last settlement was made on the basis of 3.85c. per lb. for No. 28 gage black sheets and $5.75 per base box for tin-plate, a considerable reduction in the tonnage rates will take place. Common sheets are now generally quoted at 2.75c., while tin plate is being sold by the principal district maker on a basis of $5.25.

The Standard Steel Car Co., New Castle, Pa., will resume operations at once, officials report, on a basis of 50 to 60 per cent.

CONSTRUCTIVE AIMS

President Harding's Conference Will Avoid Discussion of Irrelevant Topics

WASHINGTON, Aug. 30.—No contentious questions as to open or closed shop or conditions of work are to be permitted to enter into discussions at the national conference on unemployment to be held in Washington soon at the call of President Harding. This statement was made yesterday by Secretary of Commerce Hoover who expects to submit detailed plans for the meeting within a week or 10 days to the President. The conference is not to be the battleground of organizations of either employers or employees, it was declared, but will relate to the need of the assurance of a definite program as to business and workingmen and it is hoped to develop constructive plans through unity of action. Secretary Hoover is now at work selecting the personnel, which it is contemplated to hold down to 15 or 25 men representative of groups of employers geographically and by industries and employees. Secretary of Labor Davis is co-operating in the selection of the labor delegates. It is hoped to begin the conference by the middle of September or a little later. The iron and steel trade, being the largest industry in the country, has the greatest number of unemployed, and it is understood will be given due representation at the conference.

Many good suggestions as to relieving the labor situation have been made to Secretary Hoover, but all of the actual plans to revive industry and reinstate employment will not be developed until the conference is held. Some suggestions made relate to the matter of intermittent and irregular employment in certain industries and also to a plan for road improvement and building operations where these are seasonal and are to be permanent in character, the idea being to avoid any artificial undertakings. It is believed that the question of transportation costs will share prominently in the discussion, many industrial interests considering that the high freight rates are one of the underlying causes of unemployment, and that associated with it are high wages still being paid in some lines of work. Secretary Hoover, however, resents the terms "liquidation of labor," whatever may be done regarding wages, holding that labor is a human equation and not a matter of values in dollars and cents.

The results of the conference are likely to be used by the Administration as a part of its legislative program looking to economic readjustment, which Congress has been criticized by the business world for delaying. An instance is its failure before recessing to act upon the railroad funding bill whose enactment has been looked to as a means of restoring 500,000 men to work. But it is not, of course, intended to wait for legislation to improve employment conditions. A quicker improvement than that is hoped for, although legislation probably will be necessary to develop the complete program that is in prospect.

Weirton Operations Increased

WEIRTON, W. VA., Aug. 29.—The Weirton Steel Co., with plants here and in Clarksburg, W. Va., and Steubenville, Ohio, has reached the highest rate of operation in several months. In addition to the 26 tin plate mills at the plant here, the company has seven of the 12 mills at the Steubenville works under power, making a total of 33 of the 50 mills at the three plants in operation, or 66 2/3 per cent. To provide the sheet bars for the Steubenville tin plate mills, it was necessary to put on an additional open-hearth furnace at Weirton, making a total of six of the seven there now in operation. The company is operating its strip mills here at about 35 per cent of capacity. The company, which hitherto has been a seller of pig iron, has temporarily withdrawn for that market, as current production of about 600 tons daily is all needed at present and the management is anxious to accumulate a reserve stock against later requirements. Moreover, it is considerably more remunerative for the company to charge hot metal than to sell cold iron at current prices.

Amalgamated Enjoined

WHEELING, W. VA., Aug. 27.—Temporary injunction against the Amalgamated Association of Iron, Steel and Tin Workers, was granted the Wheeling Steel & Iron Co. by Judge R. M. Addlemen in Circuit court today. The injunction restrains the union men from picketing in the vicinity of the plants now closed because of a strike. The steel workers, however, are allowed to further their strike against the petitioner's mills. The order restrains the defendants against unlawful interference with the plaintiff's employees, picketing, force, intimidation, or unlawful persuasion, directed against the plaintiff or its employees with a view toward interfering with the operation of the plaintiff's mills, and against blockading, congregating at or near the entrance to the mills.

Industrial Chemistry Meeting at Paris

The Society of Industrial Chemistry of France will hold a meeting Oct. 9 to 12, inclusive, at the Conservatoire des Arts et Metiers, Paris, and in the same building will be held a chemical exposition under the patronage of the Minister of Commerce of France. Among the subjects to be considered at the chemical congress are: Coking industry, oils, distillation of wood and the by-products, metallurgy and electrometallurgy, electrochemistry, etc.

Swedish Prices Lower

STOCKHOLM, SWEDEN, Aug. 7.—The Swedish Iron Federation has revised prices for August. All prices are in Swedish kronen per metric ton, f.o.b. maker's yard. The dollar quotations are per gross ton, f.o.b. Swedish port:

	Kr.	
Export pig iron, 0.015 per cent sulphur, max.	145-150	$34.75-$ 35.77
Billets, annealed, over 0.45 per cent C.	400-500	86.88- 107.32
Wire rods, over 0.45 per cent C.	450-550	97.10- 117.55
Rolled open-hearth steel bars, base price	260-280	58.26- 62.35
Rolled Lancashire iron, base price	350	70.53

The hot mills and all intermediate departments at the Farrell, Pa., works of the American Sheet & Tin Plate Co. were placed in operation Aug. 29. About 700 men will be afforded employment.

The Iron Age and Its Readers

A good example of the use of THE IRON AGE as a medium through which one reader may help other readers and advance the "state of the art" in their common field was afforded Aug. 18 by the article by V. W. Aubel on what amounts to a new use of the cupola in metallurgy. The author was prompted to submit to THE IRON AGE an article he wrote some time ago after reading a brief editorial in our issue of July 11 on sulphur removal in the cupola. In this way attention has been called to the value of the cupola as a refining agent, in addition to its role as a melting medium, and to the place it can have in steel works practice.

This mention of Mr. Aubel's article is made particularly as a suggestion that other readers have experiences that might well be discussed in our columns for the common good.

Iron and Steel Markets

MEETING COMPETITION

No New Price Policy, But Some Fresh Declines

Sheet Reduction General, but Tin Plate Market Not Unsettled—New Plate Inquiry

In the varying reports from different branches of the steel industry the balance is still on the side of betterment in demand, but with no clear indication of progressive improvement ahead. Exhaustion of inventories is more marked as the occasion of buying.

Steel Corporation activities still average a fraction under 30 per cent, with the Carnegie Steel Co. running at a lower rate than in recent weeks, while the Tennessee company, owing to export and other contracts and to the improvement in the South, is at nearly half a full operation.

The competitive aspect of the market has not changed, despite widespread reports attributing a more aggressive policy to the leading producer. Actual transactions show that both the Steel Corporation and the leading independent producers are following their practice of many weeks, making such concessions as are required by new developments.

The one formal price change of the week was the general dropping to 2.75c. instead of 3c. on No. 28 black sheets and to 3.75c. from 4c. on galvanized sheets. Smaller mills first made these prices two or three weeks ago; the larger independents followed and then the Steel Corporation. The unfounded report of a $10 per ton reduction in tin plate, or to $4.75 per box, did not unsettle that market.

The reduction in sheets may have made more general the low quotations appearing from time to time in other products. Bars show less resistance to pressure, and 1.70c. is a common price, with some business in the Central West going as low as 1.60c. In plates and structural shapes also, the exceptional prices of a month ago are now more commonly made.

A measure of the decline in bar iron is the bimonthly wage settlement at Youngstown this week, by which the puddling rate falls from $11.38 per ton to $9.12.

Rail buying for this year is practically over and no interest has developed in rails for next year to call for the naming of a price for 1922. Meanwhile railroads are showing reductions in maintenance costs at the expense of their properties. But they are making a better record in paying what they owe the steel companies.

The volume of fabricated steel work which has been a continuing feature in demand has been large enough to afford tests of price strength. Tonnage contracts have been written at less than the quoted market. Besides additional car repair orders, about 7500 tons of structural work has been closed and 11,000 tons added to what is pending. Mexican oil interests are in the market for 17,000 tons of plates and an Eastern locomotive builder for 3000 tons.

Sales of pig iron in the Cleveland and Philadelphia districts amount to a very fair tonnage, but for the most part there is a subsidence from the active buying of two or three weeks in August. Following the recent activity, furnaces have made an effort to establish higher prices and have succeeded to some extent, as basic has been sold at $19, Valley, or $1 above what has prevailed for some weeks, while small sales of various grades have been made in Chicago at an advance of $1. In Buffalo and eastern Pennsylvania also the market seems somewhat firmer. Reductions in freight rates on ore and limestone within the State of Alabama will enable furnaces most favorably situated to make pig iron at a reduction of about 40c. per ton in costs.

Export trade has been better in some directions. Japan is still a steady buyer of black sheets, which are galvanized there. Japan also has bought considerable amounts of sulphate of ammonia from coke by-product plants.

China is in the market for 20,000 tons of rails after buying 35,000 tons in the past six months. Japan is about to close for 4000 tons. Germany is low bidder on 12,000 tons for Chile. The 10,000 tons lately taken by German rail mills in Java indicate that their price is $35 to $36 at shipping port. The 500 tons of 40-lb. rails they took in Cuba went at $38, delivered.

The extent of the decline in steel prices is indicated by THE IRON AGE composite, which at 2.293c. per lb. for finished steel products is now 36 per cent above the ten-year pre-war average, though it was nearly 55 per cent above this pre-war average only two months ago.

Pittsburgh

PITTSBURGH, Aug. 30.

Reports about business covering the past week are of a slightly less cheerful tenor, but there is nothing to suggest that the lull is anything more than temporary and a natural development in view of the fact that there has been a comparatively steady demand for more than a month. The recent announcement by Judge Gary that the Steel Corporation hereafter would meet competitive market prices was received with keen interest. His words were as follows:

"When the subsidiaries of the Steel Corporation ascertain to a certainty that large and important independents, so-called, are selling at prices materially lower than those which have been heretofore announced, our subsidiaries meet the new prices. They do not precipitate or lead in establishing lower prices, for they are aware that the prices which have prevailed for some time past are lower than the actual cost of production by most if not all of the producers."

The prevailing opinion is that the pronouncement has clarified the situation and that the fact the Steel Corporation now will sell as low as anyone else is likely to exert a restraining influence on promiscuous cutting of prices. This will probably mean less selling to recognized regular customers of the Steel Corporation by independents, because such buyers now will be able to match the lowest prices named by independents with those of the Steel Corporation subsidiaries.

The week has developed more clearly than was apparent recently the real selling prices. Although makers of steel bars here and in the Valley district are making a pretty strong effort to obtain 1.75c., base, Pittsburgh, there are authentic reports as low as 1.60c. has been done, and since the Steel Corporation now is

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Aug. 30, 1921	Aug. 23, 1921	Aug. 2, 1921	Aug. 31, 1920
No. 2X, Philadelphia‡	$20.84	$20.84	$21.35	$53.51
No. 2, Valley furnace†	**21.00**	20.00	19.50	50.00
No. 2 Southern, Cin'ti†	23.50	23.50	23.50	46.50
No. 2, Birmingham, Ala.†	19.00	19.00	19.00	42.00
No. 2 foundry, Chicago*	**21.00**	20.00	18.50	46.00
Basic, del'd, eastern Pa.	19.00	19.00	21.25	50.67
Basic, Valley furnace	**19.00**	18.00	18.00	48.50
Bessemer, Pittsburgh	21.96	21.96	21.96	50.46
Malleable, Chicago*	**21.00**	20.00	18.50	46.50
Malleable, Valley	20.00	20.00	20.00	50.00
Gray forge, Pittsburgh	**21.96**	21.46	21.46	50.96
L. S. charcoal, Chicago	33.50	33.50	35.00	58.50
Ferromanganese, del'd	70.00	70.00	70.00	170.00
Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill.	$45.00	$45.00	$45.00	$55.00
O.-h. rails, heavy, at mill.	47.00	47.00	47.00	57.00
Bess. billets, Pittsburgh	29.00	29.00	30.00	60.00
O.-h. billets, Pittsburgh	29.00	29.00	30.00	60.00
O.-h. sheet bars, P'gh.	30.00	30.00	32.00	68.00
Forging billets, base, P'gh.	34.00	34.00	35.00	75.00
O.-h. billets, Phila.	35.74	35.74	35.74	65.74
Wire rods, Pittsburgh	*40.00*	42.00	42.00	75.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh.	1.75	1.75	1.85	3.25
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.00	2.00	2.10	4.85
Iron bars, Chicago	1.75	1.75	1.75	3.75
Steel bars, Pittsburgh	*1.70*	1.75	1.75	3.25
Steel bars, New York	*2.08*	2.13	2.13	4.13
Tank plates, Pittsburgh	*1.70*	1.80	1.80	3.25
Tank plates, New York	*2.08*	2.18	2.18	3.63
Beams, etc., Pittsburgh	*1.75*	1.80	1.85	3.10
Beams, etc., New York	*2.13*	2.18	2.23	3.48
Steel hoops, Pittsburgh	2.25	2.25	2.40	5.50

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Aug. 30, 1921 Cents	Aug. 23, 1921 Cents	Aug. 2, 1921 Cents	Aug. 31, 1920 Cents
Sheets, black, No. 28, P'gh.	2.75	2.75	3.00	7.50
Sheets, galv., No. 28, P'gh.	3.75	3.75	4.00	9.00
Sheets, blue an'l'd, 9 & 10.	2.25	2.25	2.40	6.00
Wire nails, Pittsburgh	2.75	2.75	2.75	4.25
Plain wire, P'gh.	2.50	2.50	2.50	3.75
Barbed wire, galv., P'gh.	3.40	3.40	3.40	4.45
Tin plate, 100-lb. box, P'gh.	$5.25	$5.25	$5.25	$9.00
Old Material, Per Gross Ton:				
Carwheels, Chicago	**$13.75**	$13.00	$12.50	$38.00
Carwheels, Philadelphia	17.00	17.00	16.00	42.00
Heavy steel scrap, P'gh.	13.00	13.00	12.00	30.00
Heavy steel scrap, Phila.	11.50	11.50	11.00	26.50
Heavy steel scrap, Ch'go.	11.00	11.00	10.00	26.00
No. 1 cast, Pittsburgh	16.50	16.50	16.00	42.00
No. 1 cast, Philadelphia	17.00	17.00	17.00	40.00
No. 1 cast, Ch'go (net ton)	13.00	13.00	11.50	35.00
No. 1 RR. wrot, Phila.	14.00	14.00	14.00	33.00
No. 1 RR. wrot, Ch'go (net)	11.00	11.00	9.25	24.50
Coke, Connellsville,				
Per Net Ton at Oven:				
Furnace coke, prompt	**$3.00**	$2.75	$2.75	$17.00
Foundry coke, prompt	**4.00**	3.75	3.75	18.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	12.00	12.00	12.00	19.00
Electrolytic copper, N. Y.	*11.62½*	11.75	11.75	19.00
Zinc, St. Louis	*4.12½*	4.17½	4.20	8.10
Zinc, New York	*4.62½*	4.67½	4.70	8.45
Lead, St. Louis	4.20	4.25	4.20	8.75
Lead, New York	4.40	4.40	4.40	8.75
Tin, New York	**26.75**	26.12½	26.50	45.75
Antimony (Asiatic), N. Y.	4.50	4.50	4.60	7.00

*The average switching charge for delivery to foundries in the Chicago district is 70c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Composite Price, Aug. 30, 1921, Finished Steel, 2.293c. per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

These products constitute 88 per cent of the United States output of finished steel.

Aug. 23, 1921,	2.321c.
July 26, 1921,	2.364c.
Aug. 31, 1920,	3.974c.
10-year pre-war average,	1.684c.

meeting competition the preponderating weight is on the lower figure, because of productive capacity. On plates 1.70c., Pittsburgh, has been done and the going price on structural beams is 1.75c. These tonnage products, in other words, have declined from $1 to $3 per ton from what have been regarded as the market prices. Some very low prices have come to the surface on hot-rolled strips in the past week, sales having been made down to 2c. base, Pittsburgh, and on a large tonnage as low as 1.90c. is reported to have been made.

Single quotations again rule in sheets, all makers now being willing to take business at the low levels named by one or two makers a short time ago.

Reports with regard to plant operations are very irregular. There has been a definite gain in the activities of tin plate mills and the operations of strip mills are on a larger scale than they were recently. Sheet mill operations, on the other hand, taking the industry as a whole, have receded, while wire and pipe plants have been practically stationary. We note no gain in activities of bar, plate or structural mills and open-hearth operations do not exceed 25 per cent capacity. In the latter respect, the past two weeks have been the poorest since the depression set in as far as Carnegie Steel Co. is concerned. The Cambria Steel Co. has put on a blast furnace and in the next week or 10 days the Shenango Furnace Co. and the Hanna Furnace Co. each will put on a furnace. The pig iron market reflects a strong undertone, although a demand of sufficient proportions to carry prices up to producers' ideas still is lacking.

There is no easing in the prices of old material and the prospect of early blowing in of several idle furnaces is having its effect upon fuel prices.

Pig Iron.—All makers of basic iron in this and nearby districts are holding firmly to $20, furnace, but as yet that price has not found basis in actual sales. The same interest which recently bought 2000 tons at $19, Valley Furnace basis, has bought another 1000 tons at the same price at a Western Pennsylvania furnace. Another sale of 1000 tons is noted to a West Virginia melter, but beyond the fact that the iron was bought for less than $20, there are no details. The claim is made than this kind of iron still can be bought at $18, Valley furnaces, but no sales lately have been done as low as that and since Valley makers all are asking $20, and the Valley basis was recognized in the recent sale of 2000 tons, the fairer appraisal of to-day's market on Valley basic iron is $19. The market on foundry iron has definitely reached $21, furnace. The one Valley furnace interest which is offering this grade has turned over at least 600 tons at $21 for No. 2 grade, and that also is the price obtained from a Western Pennsylvania furnace on recent transactions. There is no change in Bessemer iron, which is moving in a small way at $20, Valley furnace. The additional furnace in blast at Cambria Steel Co. brings the total number now active in the territory from Johnstown to Wheeling, to Pittsburgh and the Valleys, to 30 out of a total of 139. Soon after Labor Day the Cherry Valley furnace, Leetonia, Ohio, and No. 3 furnace, Shenango Furnace Co., Sharpsville, Pa., will be blown in.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.96 per gross ton:

Basic	$19.00 to $20.00
Bessemer	20.00
Gray forge	20.00
No. 2 foundry	21.00
No. 3 foundry	20.50
Malleable	20.00

Ferroalloys.—Both inquiries and sales are few and small. Prices do not change much but the drift is toward lower levels. The Valley steel maker who a few weeks ago put out an inquiry for 200 to 300 tons of 80 per cent ferromanganese for September and October delivery has been quoted as low as $58 c.i.f. Atlantic seaboard on the English material, this being equivalent to slightly more than $64 delivered. This price is $2 per ton below the recent minimum quotation, and would seem to put American manufacturers out of the running, since the lowest price of any of them is $70 delivered. We note a sale of a fair sized tonnage of 20 per cent spiegeleisen within the range quoted below. Hardly enough inquiries are out for 50 per cent ferrosilicon to determine the actual price. Most makers are publicly quoting $65, furnace, freight allowed, as a minimum, but the most recent business done was at $60 and it is probable that this price could be done again.

We quote 78 to 82 per cent domestic ferromanganese at $70 delivered; 76 to 80 per cent, $68; 78 to 82 per cent British ferromanganese, $58 to $65, c.i.f. Atlantic seaboard. We quote average 20 per cent spiegeleisen at $30 to $32, delivered, Pittsburgh or Valleys; 50 per cent ferrosilicon, domestic, $60, freight allowed. Bessemer ferrosilicon is quoted f.o.b. Jackson and New Straitsville, Ohio, furnaces as follows: 10 per cent, $36.50; 11 per cent, $39.80; 12 per cent, $43.10; 13 per cent, $47.10; 14 per cent, $52.10; silvery iron, 6 per cent, $25; 7 per cent, $26; 8 per cent, $27.50; 9 per cent, $29.50; 10 per cent, $31.50; 11 per cent, $34; 12 per cent, $36.50. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is $4.06 per gross ton.

Billets, Sheet Bars and Slabs.—Very little is going on and prices to a large degree are untested. There are reports that there was an inquiry recently for 400 to 500 tons of 4-in. billets a month, over the remainder of the year, but it does not seem to have been given to more than two companies and one of them was not interested in the business. Sheet makers generally are getting fewer orders than recently and this has been accompanied by a lighter demand for sheet bars. Almost no interest is being shown in slabs. Price given below are as fair an appraisal as can be made on the limited demand.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at $29 to $30; 2 x 2-in. billets, $30; Bessemer and open-hearth sheet bars, $30; slabs, $30 to $31; forging billets, ordinary carbons, $34 to $35, all f.o.b. Youngstown or Pittsburgh mills.

Wire Rods.—Although most makers are not interested in business at less than $42 Pittsburgh, for the base size of soft rods, some business has been placed at $40 and since the appearance of a sizable order undoubtedly would develop this price, we are forced to recognize it as a quotation. No big demands are coming out at present because of the rather limited movement of the products of rods. Prices are given on page 567.

Structural Material.—Bids were opened yesterday by the Allegheny County commissioners for a new bridge over the Allegheny River at Sixteenth Street, Pittsburgh. The Fort Pitt Bridge Co., Pittsburgh, was low bidder for furnishing the steel and placing it, with a bid of $541,822. Other bids ranged up to $822,400, this being by the Independent Bridge Co., Pittsburgh. About 5000 tons of steel will be required for this bridge. The general contract for the eight-story addition to the department store of the Joseph Horne Co. has yet to be let. It is said that a price of $50 fabricated and delivered has been made on the steel for the building. Actual awards with fabricating shops here remain few and small. The McClintic-Marshall Co. has taken a highway bridge for the Pattengill Transportation Co., Cuba, an umbrella shed for the Chesapeake & Ohio Railroad, Wilmington, Ky., and the steel for the castings for dam No. 38 on the Ohio River at Aurora, Ind., all three jobs taking about 175 tons. The American Bridge Co. has taken 300 tons in addition to the original award of 1000 tons for a saw plant at Manistee, Mich. Occasional sales of plain material in small lots are being made at 1.80c., but 1.75c. is the more common quotation. Prices are given on page 567.

Iron and Steel Pipe.—Jobbers are fairly persistent though moderate buyers of standard pipe, but they are not buying very far ahead and while business has been better in August than it was in July or June, it still leaves much to be desired. No important demands are coming out for oil country goods, because so few of the oil companies are doing any drilling and those that are, seem to be well supplied with casing and drill and drive pipe. Inquiries for line pipe also are few and small. There continues to be good observance of the July 7 card on standard pipe, but on oil country and line pipe competition is sharp and prices favor buyers. Discounts are given on page 567.

Iron and Steel Bars.—While an attempt is still being made to hold merchant steel bars at 1.75c., base, only retail quantities have been moved at that figure and competitive conditions have resulted in prices of anywhere from 1.70c. down to 1.60c. Lower prices also are indicated for iron bars in view of the bi-monthly settlement of the bar iron scale at Youngstown, Ohio, yesterday, which resulted in a drop in the puddling rate from $11.38 per ton to $9.12.

We quote steel bars rolled from billets at 1.60c. to 1.70c.; reinforcing bars, rolled from billets, 1.60c. to 1.70c. base; reinforcing bars rolled from old rails, 1.60c.; renned iron bars, 2.25c. in carloads, f.o.b. mill, Pittsburgh.

Nuts, Bolts and Rivets.—There is practically no market as far as the makers here are concerned as the prices reached in other important manufacturing centers are so far below costs that makers here refuse to follow. One plant here is closed indefinitely because it had been figured out that to meet competitive prices on nuts and bolts would necessitate buying bars at 1.47c., Pittsburgh. This company made a bid of 1.50c. for bars without uncovering any supplies. The leading maker of small rivets in this district is holding to 65, 10 and 10 per cent off list on the bulk of its business, occasionally giving an additional 2½ and 5 per cent on lots involving more than a carload. It is claimed here that a Chicago district maker quoting a lower price does not make a full line of small rivets. Prices and discounts are given on page 567.

Spikes.—The market on standard spikes leans in the buyers' favor, due to the fact that competition for orders is extremely sharp. Locally $2.50 per 100-lb. base, is minimum, but it is admitted that business has been lost at this figure because of the absorption of freight by makers outside this district. It is reported that there is some deviation from the established price of $2.75 per 100-lb. on splice bars. Prices are given on page 567.

Steel Rails.—Demands for light sections still are few and small and buyers are having no trouble in placing orders for new steel rails at 1.75c. Pittsburgh, for the base sizes. Rerolled rails are holding around 1.60c. mill. Specifications for the standard rails still are rather disappointing, but there are hopes that September will develop some improvement in this respect. Reports that the prices of standard rails were to be cut at an early date find no verification here.

We quote 25 to 45-lb. sections, rolled from new steel, 1.75c.; rolled from old rails, 1.60c.; standard rails, $45 mill for Bessemer and $47 for open-hearth sections.

Plates.—The market no longer is quotable at above 1.75c., as that quotation not only is maximum, but somewhat extreme. A quotation of 1.70c. has become common lately, and it is reported that a recent inquiry brought a quotation of 1.67½c. The principal inquiry is from tank builders. The railroad equipment manufacturers are not doing much, although the Pressed Steel Car Co. recently secured an order for 53 steel passenger cars for the Tientsin Puko Railroad, China. The Baltimore & Ohio Railroad has put out an inquiry for 1000 box and 1000 hopper bodies.

We quote sheared plates, ¼ in. and heavier, tank quality, at 1.70c. to 1.75c. f.o.b. Pittsburgh.

Sheets.—Announcement by the Steel Corporation of its intention to meet competitive prices means the passing of higher prices than 2.75c. base for black, both sheet and tin mill sizes, 3.75c. base for galvanized and 2.25c. base for blue annealed. These prices were made by one independent about two weeks ago and since have been followed by several other independents. Distribution of business is rather uneven among the different companies, and between the American Sheet & Tin Plate Co. and the independent companies. While the American Sheet & Tin Plate Co. reports that last week was the best in orders and specifications in more than four months, and it now is running about 44 per cent of its sheet mills, the experience of the independents has been that orders are lighter and they

have been forced to put down some capacity. It seems to be a case that with prices the same, the Steel Corporation gets the preference. Prices are given on page 567.

Wire Products.—Makers in this and near by districts are having a fair run of small orders for quick shipment. The movement of nails continues to be very much better than that of other products, but buyers in general are slow to abandon the policy of coming into the market only for such tonnages as will meet their immediate requirements. There continues to be talk of price cutting, but it is largely talk in the case of nails and does not amount to more than $1 per ton in wire. Case is cited of a buyer wanting 2000 kegs of nails, who though willing to pay the regular base of $2.75, found it necessary to do considerable shopping to find a mill that could make the shipment as promptly as desired. It is asserted that if makers would guarantee prices against a decline they could fill up their order books, at least over the remainder of the year. The American Steel & Wire Co. now is giving a dating of Nov. 1, against woven wire fence business, thus meeting terms offered by the independents for some little time. The announcement by the Steel Corporation that it would meet competitive market prices is considered likely to be a stabilizing influence in prices of wire products, for the reason that concessions which might be made by independents now will not be a successful means of getting business, as it would be with the corporation quoting a higher price.

We quote wire nails at $2.75 base per keg, Pittsburgh, and bright basic and Bessemer wire at $2.50 base per 100 lb., Pittsburgh.

Tin Plate.—Newspaper reports that the price of production tin plate had been cut to $4.75 per base box are absolutely without foundation. The price is and has been $5.25 per base box for production plate, with stock items available at $4.75. In announcing the intention of the Steel Corporation to meet competitive prices, Judge Gary made no reference whatever to prices of any product. The real situation in tin plate is that manufacturers whose plants are in operation have had a really good business in tonnages for quick shipment and the needs of container manufacturers are so urgent that they have not questioned the price.

Hoops and Bands.—The market has definitely settled to a base of 2.25c. for these products, for that price has been the base of independent makers for the past few weeks and now is the Steel Corporation price in view of Judge Gary's recent announcement that the corporation hereafter would meet competitive prices. It is not believed that less than 2.25c. has been quoted, although the demand still is of small proportions.

Cotton Ties.—Specifications are coming in satisfactorily and it begins to look as though requirements would be heavier than was indicated a few weeks ago. German competition seems to have been successfully fought off by the reduction of 5c. per bundle made by domestic makers, following the opening of the season. September shipments carry a price of $1.32 per bundle of 45 lb., Pittsburgh, this including the carrying charge of 1c. per bundle per month on the revised opening price.

Hot-Rolled and Cold-Rolled Strips.—The full range of prices on hot-rolled strips is from 1.90c. to 2.40c., base, Pittsburgh. It is reported that the Ford Motor Co. has placed 4000 tons at the lower figure. There is a disposition to question the accuracy of this report in view of the fact that Detroit advices are that this company is figuring on a reduction in its production schedule for September to 50 per cent of that for August, and such a tonnage would considerably exceed its requirements for the coming month. It also is said that material sold at such a price would not be strictly within the specifications of strip steel, and that it probably was rolled on a skelp mill. However, some regular makers of hot-rolled strips recently have been going down to 2.10c. and even 2c. to secure tonnage orders, and others, though nominally quoting a high price, have met these figures where the loss of a customer was involved. On a strictly strip steel basis, the market is quotable from 2.20c. to 2.40c. Where a large tonnage is involved or where strips are competing with plates or sheets, prices range from 1.90c. to 2.10c. Cold-rolled strips are quotable on sales from 3.85c. to 4c., base, Pittsburgh. Business has improved but seemingly at the expense of prices.

Cold-Finished Steel Bars and Shafting.—The market on rolled or drawn steel still is quotable from 2.40c. to 2.50c., base, Pittsburgh. The general asking price is 2.50c. and some business has been done at that figure, but usually on tonnages involving less than a carload. Competitive business usually results in a price of 2.40c. The Cumberland Steel Co. quotes ground shafting at $3 per 100-lb. base, f. o. b. its mill, for carloads, and $3.25 for less carloads.

Coke and Coal.—The appearance of two or three good-sized inquiries for furnace coke, coupled with a stronger market in coal, has developed an advance of about 25c. per ton in this grade of fuel. The American Rolling Mill Co., which is blowing in one of its blast furnaces at Columbus, Ohio, has contracted for 27,000 tons for delivery over the next three months, at $3.10 per net ton, oven, and other inquiries which have been out have developed no prices of less than $3 per net ton, oven. It is probable that within the next few days a contract for 10,000 tons a month over the next three months will be closed at $3. Another inquiry for a round tonnage for last quarter shipment is on the market, against which a price of $3.25 has been named. There seems to be no furnace coke either for spot or future shipment at less than $3.

Old Material.—The market maintains a strong undertone although in some instances buyers have reduced their bids and generally the dealers are having some difficulty in obtaining the prices they ask. But as an offset to this condition, there are some dealers who are short of the market and who are trying to cover in the fear of not being able to do so later, except at a loss. Pittsburgh district steel companies using machine shop turnings are bidding $8 to $8.50 per gross ton, delivered, but the lowest price noted on any actual business has been $8.50 and we regard that as minimum, in view of the fact that one large user stands ready to take on additional tonnages at that price. The lower bids have failed to secure any material of this grade in this district and the indications point to even higher prices in view of the fact that the automotve industry, the principal source of supplies, is beginning to slow up and naturally will have smaller tonnages to offer during the next few weeks. Based on actual sales, we quote turnings at $8.50 to $8.75 per gross ton, delivered Pittsburgh, common freight points. There were several bids by Pittsburgh district interests of $8.50 per ton, or more, delivered, against the turnings offered by Dodge Bros. last Friday. Heavy melting steel has brought $13.50 on one lot of 2000 tons and it is doubtful whether any now could be bought as low as $13. The Baltimore & Ohio will receive bids until noon Sept. 6, for 19 cars and 10,530 gross tons of old material; also for 3000 lb. of high speed steel. The Pennsylvania Railroad, Eastern Region, will open bids, Sept. 1, for 28,500 net tons of old material.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate, as follows:

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh	$13.00 to $13.50
No. 1 cast cupola size	16.50 to 17.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Parkersburg and Huntington, W. Va., and Franklin, Pa.	16.00 to 16.50
Compressed sheet steel	10.50 to 11.00
Bundled sheet sides and ends, f.o.b. consumers' mills, Pittsburgh dist.	9.00 to 9.50
Railroad knuckles and couplers	14.00 to 14.50
Railroad coil and leaf springs	14.00 to 14.50
Railroad grate bars	11.00 to 11.50
Low phosphorus melting stock, b'oom and billet ends, heavy plates, ¼-in. and thicker	17.00 to 17.50
Railroad malleable	13.00 to 13.50
Iron car axles	19.00 to 20.00
Locomotive axles, steel	18.50 to 19.00
Steel car axles	14.50 to 15.00
Cast iron wheels	14.00 to 14.50
Rolled steel wheels	14.00 to 14.50
Machine shop turnings	8.50 to 8.75
Sheet bar crop ends at origin	12.50 to 13.00
Heavy steel axle turnings	10.00 to 10.50
Short shoveling turnings	9.50 to 10.00
Heavy breakable cast	15.00 to 15.25
Stove plate	12.00 to 12.50
Cast iron borings	9.00 to 9.25
No. 1 railroad wrought	12.00 to 13.00

Chicago

CHICAGO, Aug. 30.

Local producers of merchant pig iron have again advanced their prices, this time to $21, base furnace, for foundry, basic and malleable. Although buying has not been heavy at the new quotation, the market is firm.

Demand for steel continues to increase slowly, but most purchases are of small tonnages on which prompt delivery is asked. Sheet prices have definitely receded to a lower level, but the market on bars, plates and structural shapes is still in a state of confusion. It is apparent, however, that the prices announced in July, namely, 1.75c., Pittsburgh, on soft steel bars, and 1.85c., Pittsburgh, on plates and structurals, are now purely nominal in this district, and an early announcement of lower quotations corresponding more closely to actual going prices would not be surprising. On all three products, 1.50c. to 1.60c., Pittsburgh, has been done rather frequently recently and exceptionally attractive business has brought out heavier concessions. A railroad car builder, for example, closed for 2200 tons of plates at a reported price of 1.80c., Chicago. Mill and furnace operations are substantially unchanged.

Pig Iron.—Local producers have again advanced their prices this time to $21, base furnace, for foundry, malleable and basic. Purchases ranging from carload lots to several hundred tons have been made at the new prices, but on the whole buying is not so active as a week or two ago. Some contracts have been closed, however, covering requirements ranging from two months to the rest of the year, and an Illinois melter is inquiring for 1300 tons of foundry for first quarter delivery, as well as for 300 tons for fourth quarter. The furnace of the St. Louis Coke & Chemical Co. at Granite City was banked last week, as forecast in this column, thus further reducing the number of active stacks in the country. A Wisconsin melter has purchased 500 tons of 10 per cent silvery at the ruling Jackson County prices. An inquiry for 500 tons of charcoal iron has been received from an Eastern melter. Buying of foundry coke has expanded measurably and some melters who had been ordering only one carload at a time have placed contracts for from one to two months ahead. A stiffening in beehive prices would not be surprising in view of the fact that operations are at a low ebb and producers declare they will not relight ovens at the present market. Current ruling prices on beehive foundry coke range from $4.25 to $4.50, Connellsville.

Quotations on Northern foundry, high phosphorus malleable and basic irons are f.o.b. local furnace and do not include a switching charge averaging 70c. per ton. Other prices are for iron delivered at consumers' yards, or when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	$33.50
Northern coke, No. 1, sil. 2.25 to 2.75	21.50
Northern coke, foundry, No. 2, sil. 1.75 to 2.25	21.00
Northern high phos.	21.00
Southern foundry, sil. 1.75 to 2.25	25.67
Malleable, not over 2.25 sil.	21.00
Basic	21.00
Low phos., Valley furnace, sil. 1 to 2 per cent copper free	$34.50 to 35.50
Silvery, sil. 8 per cent	32.82

Ferroalloys.—Ferromanganese is stronger, as is evidenced by a sale of 100 tons at $75, delivered. There has been no activity in spiegeleisen or 50 per cent ferrosilicon.

We quote 78 to 82 per cent ferromanganese, $75 delivered; 50 per cent ferrosilicon, $62.50 to $65 delivered; spiegeleisen, 18 to 22 per cent, $36 to $37 delivered.

Railroad Equipment.—The Pere Marquette has awarded repairs on 350 wooden box cars to the International Car Co., Chicago. The Rock Island has deferred action on its inquiries for new cars and car repairs. The award of repairs by the Illinois Central, noted last week, totaled 1950 cars instead of 1400, and the distribution was as follows: Five hundred box and 250 Roger ballast cars to the Pullman company, 400 box cars to the Ryan Car Co., 300 gondola cars to the Haskell & Barker Car Co., and 500 box cars to the American Car & Foundry Co.

Rails and Track Supplies.—Outside of a number of carload orders for track bolts and standard railroad spikes, there has been little new business in track supplies. There have also been some releases against contracts for the same commodities, but on the whole bookings are disappointing. In fact, it is reported that the railroads are borrowing from each other rather than to enter the market for their needs. Light rails are weaker and are now bringing a maximum of 1.75c., mill.

Standard Bessemer rails, $45; open-hearth rails, $47; light rails rolled from new steel, 1.75c. f.o.b. makers' mills.

Standard railroad spikes, 2.50c. to 2.75c., Pittsburgh; track bolts with square nuts, 3.50c. to 3.75c., Pittsburgh; tie plates, steel and iron, 2c. to 2.25c., f.o.b. makers' mills.

Plates.—A Chicago district car builder has bought 2200 tons of plates from a local mill. The steel for the car repairs let by the Illinois Central last week has not yet been placed and the tonnage will probably not run very heavy, as all of the cars have wooden superstructures. The Chicago, Burlington & Quincy takes public bids on Sept. 2 on 1500 tons of plates and 350 tons of structural shapes. The same road is inquiring for 500 tons of car parts. In the aggregate, inquiry for plates shows little improvement and competition for business has been keen. The so-called official price of 1.85c., Pittsburgh, is now little more than nominal and orders are going at concessions ranging all the way from $4.50 to $7.50 a ton. Owing to the present propensity of buyers to limit their purchases to small tonnages for prompt delivery, the exceptional inquiries of size and desirable specifications are bringing out extraordinary inducements from the mills. Hence on most current orders the ruling market appears to be 2c., Chicago.

The ruling mill quotation is 2c., Chicago. Jobbers quote 2.88c. for plates out of stock.

Structural Material.—With fabricating work diminishing rather than increasing and demand from other sources light, business in plain material is at a low ebb. The mill price of 1.85c., Pittsburgh, which is still adhered to by some makers, is no longer getting any business of consequence in this section. Actual going prices range all the way from 2c. to 1.85c., Chicago, the extreme concessions being named on attractive tonnages. Current fabricating jobs are small with the exception of a 3000-ton airship hangar to be erected at Belleville, Ill., noted in the St. Louis column last week. Recent fabricating awards include:

Logan Square Masonic Temple, Chicago, 320 tons, to A. Bolter's Sons Co.

Hutchinson Lumber Co., one 120-ft. single track through girder span, Oroville, Cal., 120 tons to American Bridge Co.

South Dakota State Highway Commission, two 198-ft. spans, 163 tons, to Standard Bridge Co., Omaha.

Pennsylvania Tank Line Co., two buildings, Kansas City, Mo., 225 tons, to Kansas City Structural Steel Co.

Pending business includes:

Southside High School, Fort Wayne, Ind., 300 tons.

Courthouse, Rapid City, S. D., 250 tons.

Powerhouse, Gallup American Coal Co., Gallup, N. M., 275 tons.

The mill quotation is 1.85c. to 2c., Chicago. Jobbers quote 2.88c. for materials out of warehouse.

Bolts and Nuts.—The Ford Motor Co. bought its monthly requirements of bolts and nuts last week. Business in general remains light. Jobbers, railroads and manufacturing consumers still adhere to the cautious policy of buying only for their immediate needs. The price situation is still unsettled, but the discounts named in this paragraph last week appear to be representative.

Jobbers quote structural rivets, 3.68c.; boiler rivets, 3.78c.; machine bolts up to ⅞ x 4 in., 60 per cent off; larger sizes, 55 off; carriage bolts up to ⅞ x 6 in., 55 off; larger sizes, 50 and 5 off; hot pressed nuts, square and hexagon tapped, $3 off; blank nuts, $3.25 off; coach or lag screws, gimlet points, square heads, 60 per cent off. Quantity extras are unchanged.

Sheets.—Mill prices on black and galvanized sheets have been reduced to 2.75c. and 3.75c., base Pittsburgh, respectively. The ruling price on blue annealed continues to be 2.25c., Pittsburgh, for No. 10 gage. Warehouse quotations have been marked down to conform with the new mill prices and are appended below. The demand for sheets is of fair proportions, as indicated by the fact that the local independent continues to operate 14 out of 18 hot mills.

Mill quotations are 2.75c. for No. 28 black, 2.25c. for No. 10 blue annealed and 3.75c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight to Chicago of 38c. per 100 lb.

Jobbers quote: Chicago delivery out of stocks, No. 10 blue annealed, 3.38c.; No. 28 black, 4.15c.; No. 28 galvanized, 5.15c. Hoops and bands, 3.48c.

Bars.—There has been no material improvement in the demand for mild steel bars and 1.75c., Pittsburgh, is merely a nominal quotation in this district. On most orders 1.50c. to 1.60c., Pittsburgh, is being done, and in some cases as low as 1.42c. has been named. That buyers have permitted their stocks to dwindle almost to the vanishing point is indicated by the increasing number of requests for immediate shipments. In a number of instances, they have failed to find mills which could furnish the material and have been forced to buy out of stocks. Current reinforcing jobs are mostly under 100 tons each, an exception being a factory addition for the Cuneo-Henneberry Co., Chicago, involving 450 tons, which will be furnished by the Inland Steel Co. There is little demand for bar iron and while as low as 1.65c., mill, has been done, the ruling price remains 1.75c., mill. Although some concessions have been made in this market of late, the ruling market on rail carbon steel bars remains 1.75c., mill. The operations of bar iron and hard steel bar mills are still of an intermittent character.

Mill prices are: Mild steel bars, 1.50c. to 1.75c., Pittsburgh, taking a freight of 38c. per 100 lb.; common bar iron, 1.75c., Chicago; rail carbon, 1.75c., mill or Chicago.

Jobbers quote 2.78c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars is 4.20c. for rounds and 4.70c. for flats, squares and hexagons. Jobbers quote hard and medium deformed steel bars at 2.53c. base.

Old Material.—The market is quiet and consuming demand is principally from small gray iron and malleable foundries. A second advance in pig iron has tended to strengthen the foundry grades, car wheels having advanced and the other items being on a firmer footing. Generally speaking, consumers are still reluctant to pay the advanced prices and continue to offer to buy at quotations current two or three weeks ago. One iron mill, however, has purchased in excess of 500 tons of No. 1 wrought at $11.50 per net ton. Dealers are not buying so actively as they were, although some short interests are in the market for brake shoes and No. 1 wrought. The largest railroad offering is 10,000 tons advertised by the Baltimore & Ohio. Blind lists have been received from the Erie and the Michigan Central.

We quote delivery in consumers' yards Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	$15.00 to $15.50
Relaying rails	27.50 to 30.00
Car wheels	13.75 to 14.25
Steel rails, rerolling	13.00 to 13.50
Steel rails, less than 3 ft	12.50 to 13.00
Heavy melting steel	11.00 to 11.50
Frogs, switches and guards cut apart	11.00 to 11.50
Shoveling steel	10.25 to 10.75
Low phos. heavy melting steel	13.50 to 14.00
Drop forge flashings	7.00 to 7.50
Hydraulic compressed sheet	7.00 to 7.50
Axle turnings	8.00 to 8.50
Per Net Ton	
Iron angles and splice bars	14.00 to 14.50
Steel angle bars	10.50 to 11.00
Iron arch bars and transoms	14.00 to 14.50
Iron car axles	18.50 to 19.00
Steel car axles	13.00 to 13.50
No. 1 busheling	9.00 to 9.50
No. 2 busheling	6.25 to 6.75
Cut forge	9.50 to 10.00
Pipes and flues	6.50 to 7.00
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	10.00 to 10.50
Steel knuckles and couplers	11.50 to 12.00
Coil springs	13.00 to 13.50
No. 1 machinery cast	13.00 to 13.50
Low phos. punchings	11.50 to 12.00
Locomotive tires, smooth	11.00 to 11.50
Machine shop turnings	3.50 to 4.00
Cast borings	5.00 to 5.50
Stove plate	12.00 to 12.50
Grate bars	10.00 to 10.50
Brake shoes	11.00 to 11.50
Railroad malleable	12.50 to 13.00
Agricultural malleable	12.50 to 13.00
Country mixed	8.50 to 9.00

Wire Products.—Orders are numerous but lacking in size. Jobbers are buying rather generally, but as yet are not laying in stocks for fall trade. Railroad buying is less in evidence than a week or two ago. Trade from the manufacturing consumers is small. Prices are holding firmly except on cement coated nails, on which there has been some shading of late. For mill prices see finished iron and steel, f.o.b. Pittsburgh, page 567.

We quote warehouse prices f.o.b. Chicago: No. 9 and heavier black annealed wire, $3.38 per 100 lb.; No. 9 and heavier bright basic wire, $3.53 per 100 lb.; common wire nails, $3.48 per 100 lb.; cement coated nails, $2.90 per keg.

Cast Iron Pipe.—Detroit has again rejected bids on 1500 tons and will readvertise. Milwaukee will take bids Sept. 9 on 1928 tons of straight pipe, largely 54-in. with a few pieces of 36-in.; 241 tons of lugged pipe and 376 tons of special castings. Cedarburg, Wis., receives tenders to-day on 600 tons of four, six, eight and 10-in.

We quote per net ton, f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in., $45.60 to $48.60; 6-in. and above, $42.60 to $45.60; class A and gas pipe, $3 extra.

New York

NEW YORK, Aug. 30.

Pig Iron.—The buying of the middle August period has subsided, although there is still fair inquiry, including 1500 tons for delivery after Jan. 1. The furnace company referred to last week as having purchased at least 1000 tons has contracted for about double that amount for No. 2X and No. 2 plain for the last quarter. Furnace quotations show little, if any, change. Furnace operators who were selling below cost find it difficult to advance quotations and at least one furnace is expecting to go out about Oct. 1, by which time it is estimated all the iron it has sold will be delivered. The usual furnace quotations for No. 2 plain, eastern Pennsylvania, are $19 to $19.50, while Buffalo furnaces seem to have established the $20 furnace price. Virginia iron is selling at from $22 to $23, furnace, in very limited quantities.

We quote delivered in the New York district as follows, having added to furnace prices $2.52 freight from eastern Pennsylvania, $5.46 from Buffalo and $6.16 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	$22.52 to $23.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	22.02 to 22.52
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	21.52 to 22.52
Buffalo, sil. 1.75 to 2.25	24.46 to 25.46
No. 2 Virginia, sil. 1.75 to 2.25 (nom'l)	28.16 to 29.16

Ferroalloys.—Reports persist of claims by buyers that ferromanganese has been offered lower than the prevailing quotation, but sellers deny that any sales have been made at less than $65, seaboard, for the British alloy and $70, delivered, for the American product. Sales of carload lots are reported and there is an inquiry for 100 tons from a Western New York consumer. The chief item of interest in the spiegeleisen market is an inquiry for 350 tons for early delivery. There is no demand for high grade manganese ore and quotations are unchanged. The 50 per cent ferrosilicon market is exceedingly quiet and prices are firm. Quotations are as follows:

Ferroalloys	
Ferromanganese, domestic, delivered, per ton	$70.00
Ferromanganese, British, seaboard, per ton	$65.00
Spiegeleisen, 20 per cent, furnace, per ton	$25.00 to $27.00
Ferrosilicon, 50 per cent, delivered, per ton	$60.00 to $67.00
Ferrotungsten, per lb. of contained metal	48c. to 58c.
Ferrochromium, 6 to 8 per cent carbon, 60 to 70 per cent Cr., per lb. Cr	14c.
Ferrovanadium, per lb. of contained vanadium	$4.50
Ferrocarbontitanium, 15 to 18 per cent, net ton	$200.00
Ferrocarbontitanium, 15 to 18 per cent, 1 ton to carloads, per ton	$220.00
Ferrocarbontitanium, 15 to 18 per cent, less than 1 ton, per ton f.o.b. Niagara Falls, N. Y.	$250.00
Ores	
Manganese ore, foreign, per unit, seaboard	20c.
Tungsten ore, per unit, in 60 per cent concentrates	$3.00 up
Chrome ore, 40 to 45 per cent Cr_2O_3, crude, per net ton, Atlantic seaboard	$20.00 to $25.00
Chrome ore, 45 to 50 per cent Cr_2O_3, crude, per net ton, Atlantic seaboard	$30.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	55c. to 60c.

Cast Iron Pipe.—Considering the period of the year, business holds up fairly well. There is no new municipal business before the trade. Next month the usual seasonal slump is looked for. We quote per net ton, f.o.b. New York, carload lots, as follows: 6-in. and larger, $42.30; 4-in. and 5-in., $47.30; 3-in., $57.30, with $4 additional for Class A and gas pipe.

Finished Iron and Steel.—On the whole, a larger volume of inquiries has marked the week over those of the recent past, but prices do not seem to have stiffened. One instance was found of a seller who booked more business in the last week than in any other week this year, and the month bids fair to be the best of

the year. Demand is of rather a broad nature except in cold finished steel and cold rolled strip steel, which seem still to be in fairly heavy stocks in consumers' hands. As to prices, 1.70c., Pittsburgh, is easily obtainable on large lots of plates, and while bars have been done at 1.65c. in some special cases, there is evidence that 1.70c. is also the going price for bars, although business is still done at 1.75c. Structural shapes are dropping to a parity with plates, and on large structural operations it is probable that 1.75c. is a top figure. At least one buyer of national operations has disregarded Pittsburgh in Chicago purchases, using round figures for that delivery in estimating. Fabricated steel awards of the week include 600 tons for the Sinclair Valentine Co., New York, to the Hinkle Iron Co.; 250 tons for the Methodist Publishing Co., Richmond, Va., to the Richmond Structural Steel Co.; 300 tons for apartments at Elmhurst to Kues Brothers; 1000 tons for the Allerton Housing Corporation, Lexington Avenue and Fifty-seventh Street, to the Paterson Structural Steel Co., which also took 1500 tons for the Henry Schiff apartment, Riverside Drive; 3100 tons for the Bamberger store, Newark, to the Hay Foundry & Iron Works. The Fort Pitt Bridge Co. was low bidder on the 5000-ton Sixteenth Street bridge, Pittsburgh. For the bridge at Aqueduct, N. Y., taking 350 tons, Lathrop, Shea & Henwood Co., Buffalo, is general contractor. Among new projects are a laboratory building for Yale University, 1000 tons, and 700 tons for a hospital at Hackensack, N. J. In car building lines the Baltimore & Ohio is in the market for 1000 hopper car bodies and 1000 box car bodies. The Illinois Central car repair contracts cover 1422 cars and were divided among four companies. The Pressed Steel Car Co. will build 53 passenger cars for the Chinese Government railroads.

We quote for mill shipments, New York, as follows: Soft steel bars, 2.08c.; plates, 2.08c. to 2.13c.; structural shapes, 2.13c. to 2.23c.; bar iron, 2.08c.

Old Material.—When the so-called better tone is analyzed, it appears to be due to conditions between brokers and dealers rather than because of a demand on the part of mills. An example of this was the raising of the buying price of pipe to the extent of 25 cents by a leading New York broker to facilitate his covering on an old contract. One broker has been trying to dispose of 3000 tons of one grade at an attractive figure which would undoubtedly interest mills in normal times. However, no mills have shown interest. The New York Central decided not to sell its 1500 tons of relaying rails, since it holds out for $30 and has not secured bids that high. Heavy melting steel is before the market in two grades, yard steel and rails or equivalent.

Buying prices per gross ton, New York, follow:

Heavy melting steel, yard	$7.00 to $7.50
Heavy melting steel, rails or equivalent	8.25 to 8.75
Rerolling rails	10.00 to 10.50
Relaying rails, nominal	37.50 to 40.00
Steel car axles	10.00 to 11.00
Iron car axles	16.00 to 17.00
No. 1 railroad wrought	10.50 to 11.00
Wrought iron track	7.50 to 8.75
Forge fire	5.00 to 5.50
No. 1 yard wrought, long	9.00 to 9.50
Light iron	2.00 to 2.50
Cast borings (clean)	5.00 to 5.50
Machine-shop turnings	2.50 to 3.50
Mixed borings and turnings	2.50 to 3.00
Iron and steel pipe (1 in. diam., not under 2 ft. long)	8.00 to 8.50
Stove plate	9.50 to 10.00
Locomotive grate bars	8.50 to 9.25
Malleable cast (railroad)	8.50 to 9.00
Car wheels	11.00 to 11.50

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, follow:

No. 1 machinery cast	$16.00 to $17.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	15.00 to 16.00
No. 1 heavy cast, not cupola size	14.00 to 15.00
No. 2 cast (radiators, cast boilers, etc.)	9.50 to 10.50

Warehouse Business.—With most warehouses in this district, the past month resulted in a slightly larger volume of business than July, which, however, was the poorest month of the year. Prices on practically all items are nominal. Particularly in the wrought iron and steel pipe field is there a tendency to quote competitive prices regardless of the established warehouse schedule. About the only decrease in prices during the past week is noted in black sheets, which are now being sold as low as 4c. per lb. for No. 28 gage. Brass and copper warehouses report business dull and prices unchanged. We quote prices on page 580.

High Speed Steel.—Dullness continues, although some producers report a continuation of the slight increase in activity during the past few weeks. Quotations continue at about 90c. to $1 per lb. for 18 per cent tungsten high speed steel.

Birmingham

BIRMINGHAM, ALA., Aug. 30.

Reductions on ore and limestone to Alabama furnaces effective on or before Oct. 1, as declared by the Alabama Public Service Commission, make a maximum saving of about 40c. to 42c. a ton in the manufacture of pig iron, compared with present cost for the most favorably situated furnaces. In the 25-mile zone, the ore rate is reduced from 50c. to 37c. This makes 39c. on three tons of ore. The reduction on limestone is from 40c. to 37c. This is about 1c. on the amount of stone used to make a ton of iron. Coal and coke rates were not changed. Reduced rates on greater distances are not so great, that on ore in a zone from 25 to 50 miles being reduced from 60c. to 47c. and that on stone from 50c. to 47c. The Sloss-Sheffield and Republic companies benefit most by the reductions.

Pig Iron.—While business was mainly confined to small lots for prompt movement last week, it was marked by a solid front both as to $19 base and the 50c. differentials. The last known deal made under this was for 1700 tons of pipe iron, in which the average base was $18.50 with the usual charge for differentials. This was about Aug. 19. After that, all makers charged $19 flat. Toward end of the week a pipe interest tried several makers on 1500 tons of 2.25 to 3.25 silicon at $19, but the proffer was not accepted. About that time brokers are known to have placed orders for lots at $19 base, one lot of 100 tons of 3.25 to 3.75 silicon bringing $20.50. The inquiry for 40,000 tons for India was received, but little interest was shown in it. Stocks are in bad shape from grade standpoint. One maker has no high silicons and another has no silicon under 3.25. This causes a continuous refusal of orders or changes as to grades. The week was marked by the re-entrance of Cincinnati and St. Louis territory buyers for small lots. St. Louis took 100 tons and Cincinnati took several small lots at uniform base of $19. Apparently the melters were glad to get in at the price paid. Melt of stove foundries and others in the South is increasing and their inclination to cover is more pronounced. Stocks are going down. Preparations to have furnaces ready to go in are under way, but none forecast additional furnace activity before lower rates on ore and limestone go in effect Oct. 1. The reductions in these rates was only 25 per cent in shortest zones, much less in longer hauls. The general tendency of the market is to harden to a higher base.

We quote per gross ton f.o.b. Birmingham district furnace, as follows:

Foundry, sil. 1.75 to 2.25	$19.00
Basic	18.00
Charcoal	35.00

Finishing Mills.—Finishing steel works are on greater production schedule, the Tennessee company having progressed to one of 65 per cent. The rail mill for two weeks has been on night and day turn, producing 9000 tons compared with the prior production of 6000. New car works has begun turning out 10 standard steel freight cars per diem. Wire drawing mills appear to have attained 35 per cent capacity with wire fencing again on the order books following better feeling in the country. Hoop and tie mills continue operations at normal.

Cast Iron Pipe.—It was a quiet week in high pressure pipe, but the price base remained firm around $35 with numbers of small orders and one shop at 100 per cent capacity. Sanitary pipe is running about the same as for several weeks with a fair demand and

sharp competition on a $40 base for standard and $35 for extra heavy.

Coal and Coke.—Foundry coke is more firm at $6.50, the $6 base seeming to have disappeared owing to the strengthening of the demand. Bunker coal at New Orleans and Mobile is quite active. General trade is much improved.

Old Material.—Cast scrap is moving out of yards in considerable volume owing to increase in shop operations. Heavy melting steel is still weak, but the outlook is improving.

We quote per gross ton f.o.b. Birmingham district yard as follows:

Steel rails	$10.00 to $11.00
No. 1 steel	9.00 to 10.00
No. 1 cast	15.00 to 16.00
Car wheels	15.00 to 16.00
Tramcar wheels	12.00 to 13.00
No. 1 wrought	13.00 to 14.00
Stove plate	9.00 to 10.00
Cast iron borings	6.00 to 7.00
Machine shop turnings	6.00 to 7.00

Boston

BOSTON, Aug. 30.

Pig Iron.—Eastern Pennsylvania $19.50 iron has disappeared from this market, those furnaces quoting adhering to $20 furnace or $24.06 delivered for No. 2 plain and No. 2X. On No. IX iron, prices spread from $20.50 to $21.50. Both Buffalo No. 2 plain and No. 2X are obtainable at $20 furnace or $25.46 delivered common points, but $20.50 furnace or $25.96 delivered on No. 2X was done on car lots this week. Sufficient inquiry to establish a market for Virginia iron is lacking. Alabama iron is offered on a flat basis of $19 furnace for No. 2 plain. One producer is asking foundries to take definite action on iron contracted for, held at furnace. Aside from 100 tons eastern Pennsylvania No. 2X, sold to a Maine foundry at $20 furnace, business reported this week was in car lots of eastern Pennsylvania and Buffalo at prices noted above. New inquiries include 1000 tons, silicon 1.25 to 1.80, 750 tons, silicon 2.75 to 3.25, and 200 tons No. 1X, all from Connecticut consumers; 300 tons charcoal iron from a nearby melter; and numerous car lots, mostly No. 2X and No. 1X. Foundries are bidding low for business. A Massachusetts foundry recently took city water department work at 2½c. per lb. On small castings requiring a fine finish, prices quoted to-day are more than 50 per cent under those named a year ago. A Massachusetts manufacturer is paying 4.6c. per lb. for gray iron castings that cost 15.5c. a year ago. Delivered pig iron prices follow:

East. Penn. sil. 2.25 to 2.75	$24.06 to $25.06
East. Penn. sil. 1.75 to 2.25	24.06 to 24.56
Buffalo sil. 2.25 to 2.75	25.46 to 26.46
Buffalo sil. 1.75 to 2.25	25.46 to 25.96
Virginia sil. 2.25 to 2.75	31.08 to 33.08
Virginia sil. 1.75 to 2.25	30.58 to 32.58
Alabama sil. 2.25 to 2.75	30.16
Alabama sil. 1.75 to 2.25	29.66

Warehouse Business.—Consumption of iron and steel continues to increase, although slowly. Two local warehouses are well supplied, but a majority are pushing mills for deliveries on material ordered earlier in August because stocks are broken. Receipts of nails have materially increased this week and prompt warehouse deliveries are now guaranteed. Most firms quote wire nails at $3.85 base. One, however, quotes $3.65 per keg base. Stove bolts have been cut 10 per cent, and two important manufacturers of vises have reduced prices about as much.

Finished Material.—An order for 900 tons girder and 200 tons standard T rails and 1250 pairs of joints placed by the Boston Elevated Railway Co. with an eastern Pennsylvania mill constitutes the outstanding feature of the finished material market this week. The Copley Square Trust Building, Boston, is taking bids on 250 tons of structural steel and Stone & Webster on 123 tons for a Far Rockaway, L. I., power house project. Local fabricators also are bidding on 480 tons for a Cornell University building. Actual structural tonnages placed since last reports were confined to small individual lots. Such jobs are plentiful and large as well as small fabricators are bidding for work. Structural prices are inclined toward weakness. On one round tonnage offered this week, as low as $61.50 was bid for steel, fabricated and erected. The plate market is soft, 1.75c., Pittsburgh, having been done on sheared. Sheet quotations have been revised to correspond with those made at other centers. Otherwise iron and steel prices hold steady with incoming business as good or slightly better than previously reported.

Jobbers now quote: Soft steel bars, $2.81½ per 100 lb. base; flats, $3.83 to $3.93; concrete bars, $2.50 to $3.09; tire steel, $4.20 to $4.70; spring steel, open hearth, $5.25; crucible, $11.50; steel bands, $3.46½ to $3.98; steel hoops, $4.18; toe calk steel, $5.25; cold rolled steel, $4.15 to $4.65; structural steel, $2.81½ to $2.96½; plates, $2.91½ to $3.10; No. 10 blue annealed sheets, $3.73; No. 28 black sheets, $4.75; No. 28 galvanized sheets, $5.75; refined iron, $2.83 to $4.75; best refined, $4.75; Wayne iron, $7; Norway iron, round, ¼-in. to 2½-in., 7.10c. per lb. net; other sizes, 7.75c. base.

Coke.—New England producers of foundry coke continue to quote $10.66 delivered for spot and contract fuel where the local freight rate does not exceed $3.40, and nothing indicates a change within the near future. New business and shipments on contracts are no more than holding their own, consequently oven operations do not increase. Although there is little forward buying, a slight increase in foundry activities is expected following Labor Day. Connellsville foundry cokes are not much of a factor in this market.

Old Material.—A Pennsylvania structural rolling mill this week secured a small tonnage of steel at $11.50 delivered and Bethlehem, Pa., interests bought a little. Generally speaking, however, prices offered by the mills are not sufficiently high to bring out material. One melter raised his bid on pipe from $7.50 to $8.50 without success. Otherwise activity in the old material market centers in No. 1 machinery cast, car lots of which are reported sold this week at $17.50 delivered. Holders want more money, but few foundries are interested, consequently prices do not fluctuate much when an actual sale is made. One dealer sold a small tonnage of No. 2 machinery cast at $12.50 delivered, but this cannot be considered a criterion of the market.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$17.50 to $20.00
No. 2 machinery cast	15.50 to 17.50
Stove plate	16.00 to 17.00
Railroad malleable	15.50 to 16.00

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$5.50 to $6.50
No. 1 railroad wrought	10.50 to 11.00
No. 1 yard wrought	8.50 to 9.00
Wrought pipe (1 in. in diameter, over 2 ft. long)	7.50 to 8.50
Machine shop turnings	2.50 to 3.00
Cast iron borings, rolling mill	3.50 to 4.50
Cast iron borings, chemical	3.50 to 4.50
Blast furnace borings and turnings	2.50 to 3.00
Forged scrap and bundled skeleton	5.00 to 5.50
Street car axles and shafting	12.00 to 12.50
Car wheels	11.00 to 11.50
Rerolling rails	9.00 to 10.00

Cincinnati

CINCINNATI, Aug. 30.

Pig Iron.—Several good-sized sales were reported during the week, the interest chiefly centering in malleables. A West Virginia car company closed on 1000 tons, and a central Ohio melter took a similar amount. A local melter brought 450 tons of foundry iron and another 100 tons. A Hamilton foundry bought 100 tons of Southern iron and melters outside of this immediate district were responsible for several sales running up to 300 tons. A northern Ohio melter is inquiring for 600 tons of malleable, 100 tons of which is for prompt shipment, and the remaining 500 for the rest of the year. The Louisville & Nashville Railroad will close Tuesday for 400 tons. The American Radiator Co. is inquiring for 400 tons for its north Birmingham plant, and the National Cash Register Co. 100 tons for Dayton. A northern Indiana melter is also in the market for 500 tons of foundry. Prices have not changed with the exception of Chicago district iron, in the past week, those furnaces having advanced to $21 on Thursday. In the South $19 is being firmly held. And in southern Ohio the quotations range from $20 to $20.50. All the sales recorded above were made at the current market, but it is reported that furnaces in districts other than Chicago are considering advancing from $1 to $2 a ton. The Mating Iron & Steel Co. will blow in a furnace at

Ironton on Sept. 15 and one stack of the American Rolling Mill Co. at Columbus will likely be in this week.

Based on freight rates of $4.50 from Birmingham and $2.52 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$23.50
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	24.00
Ohio silvery, 8 per cent sil	30.02
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	22.52
Basic, Northern	21.52
Malleable	22.52

Finished Material.—Some fair sized orders for finished material were placed during the week. These included an order for 300 tons of structural shapes taken on the basis of 1.80c. Pittsburgh. An order for 300 tons of reinforcing bars is reported to have gone to an Ohio mill at 1.50c. Pittsburgh. These bars, it is said, will be rolled from new billets. There has been some inquiry for galvanized sheets, but the market for black sheets is slow and weaker. On blue annealed, 2.25c. is the general asking price, and on galvanized 3.75c. is holding fairly well. Quotations of 2.55c. on black sheets, or $4 per ton below the regular market, are reported. On new bars, 1.75c. Pittsburgh is the general asking price and this figure was secured on a lot of 100 tons taken by an independent mill during the week. Some orders for nails and wire products were placed at the regular schedules, and there is apparently no confirmation for the report that nails can be had from mills in Southern Ohio at 2.50c. Pittsburgh. In the structural field, there is very little activity. A municipal powerhouse at Frankfort, Ind., involving 130 tons is up for bids. An umbrella shed for the new Covington, Ky., station, taking 80 tons, has been awarded to the McClintic-Marshall Co. E. M. Sculley, Columbus, Ohio, is low bidder on the Kellogg Avenue, Cincinnati, bridge. This award will likely be made within the next week. Plant operations will not materially change during the week. The American Rolling Mill Co., Middletown, will have 10 mills in operation. The Whitaker-Glessner Co., at Portsmouth, Ohio, will be idle as well as the Andrews Steel Co. and Newport Rolling Mill Co., Newport, Ky. The two latter plants have broken off negotiations with the Amalgamated Association and will hereafter be operated without any agreement.

Warehouse Business.—Some jobbers report a greater number of small orders. The tonnage involved is also showing some increase, but as a rule, manufacturers are buying only for their immediate needs. There have been no further price reductions and jobbers quote:

Iron and steel bars, 3c. base; hoops and bands, 3.75c. base; shapes, 2.85c. base; plates, 2.85c. base; reinforcing bars, 3.07½c. base; cold rolled rounds, 1¼ in. and larger, 4.25c.; under 1¼ in. and flats, squares and hexagons, 4.75c.; No. 10 blue annealed sheets, 3.50c.; No. 28 black sheets, 5c.; No. 28 galvanized sheets, 5.75c.; wire nails, $3.25 per keg base; No. 9 annealed wire, $3.00 per 100 lb.

Coke.—There is some activity in the coke market, foundry cokes in carload lots being sought. Occasionally, however, larger tonnages are purchased. Two inquiries for 400 tons each are pending. Prices are practically unchanged, Connellsville furnace being quoted at $2.75 to $3 and foundry at $3.75 to $4.50. Wise County is quoted at $5 to $6 and New River at $7 to $8.50. By-product coke is quoted at $6.50, Connellsville basis.

Old Material.—A central Ohio steel company is reported to have purchased a tonnage of borings and turnings at around $8.50 delivered. There is very little activity, however, the market practically being in the hands of dealers. The B. & O. is offering 11,000 tons. Prices, while firmer, are not quotably changed.

We quote dealers' buying prices:

Per Gross Ton		
Bundled sheets	$4.00 to	$5.00
Iron rails	11.00 to	12.00
Relaying rails, 50 lb. and up	25.00 to	26.00
Rerolling steel rails	10.00 to	11.00
Heavy melting steel	8.50 to	9.50
Steel rails for melting	9.00 to	10.00
Car wheels	11.50 to	12.50
Per Net Ton		
No. 1 railroad wrought	8.50 to	9.50
Cast borings	2.00 to	2.50
Steel turnings	1.00 to	2.00
Railroad cast	11.00 to	12.00
No. 1 machinery	12.00 to	13.00
Burnt scrap	6.50 to	7.50
Iron axles	15.00 to	16.00
Locomotive tires (smooth inside)	8.50 to	9.50
Pipes and flues	4.00 to	5.00

Buffalo

BUFFALO, Aug. 30.

Pig Iron.—About 12,000 tons of various grades has been sold here at an average price of $20.50 base grade. Some inquiry from Valley points is engaging one seller and the understanding is that foundry iron is scarce at these places, while it is a known fact that the Buffalo market is weak. There is no change in the situation with reference to future business; contracts are made on 30- and 60-day delivery basis. A number of small foundries have reopened and better operation is noticed in foundries which have been barely active. One producer sold 7000 tons and the lot included one 1000-ton order and several 500-ton lots. Sales of 2500 tons made by a furnace were on a base price of $20 for No. 2 plain. Offerings of desirable tonnages at lower prices were refused. Furnace operation is unchanged and there is no likelihood of any change in the near future. Inquiry of 4500 tons with one furnace is scattered and consists of 25 items.

We quote f.o.b. dealers' asking prices per gross ton Buffalo as follows:

No. 1 foundry, 2.75 to 3.25 sil	$21.75
No. 2X foundry, 2.25 to 2.75 sil	20.75
No. 2 plain, 1.75 to 2.25 sil	20.00
Basic (nominal)	21.00
Malleable (nominal)	22.00
Lake Superior charcoal	33.75

Finished Iron and Steel.—With the exception of bar business, improvement is general and demand is improving. Sheet and pipe orders have improved in a satisfactory manner and in the latter case some carload business appeared; mostly for small sizes as used by steamfitters. The lack of interest by bar buyers is accounted for by the excessive stocks held by jobbers and consumers when drastic price cuts were announced and in consequence these stocks have moved slowly. Sheet business is better, due to growing interest on the part of motor car builders. A desirable local inquiry for an unusual tonnage in bolts and nuts is in the market and the competition for this business consisting of two carloads is more than ordinarily keen. Some belief is expressed that still lower prices will be forthcoming Sept. 1, but the number of small orders shows an increase from week to week. The prevailing bar price is 1.75c. and is steady. A local agency lost a desirable tonnage through its refusal to meet a 1.70c. price, but despite this rumors are current of bar prices as low as 1.60c. An inquiry is out for 150 tons of reinforcing bars for an interest at Carthage, N. Y., and about 350 tons of the same material will be bought by contractors erecting an addition to the plant of the American Hardwall Plaster Co., Utica, N. Y. Wire orders show steady and consistent gain and the mill concentrating on this business reports a normal demand. Tin plate is quiet and price cutting is reported occasionally. The Lackawanna Bridge Co. will fabricate 400 tons for a Niagara Falls high school. In structural mills orders ranging from one to 15 tons are eagerly sought—a contrast to the situation a year ago when business of that character was disregarded.

Warehouse Business.—Sheet prices have been reduced on three grades; on galvanized and black sheets the reductions are $5 a ton and on blue annealed $3 per ton. The volume of business has been steady and while no large tonnages have moved, orders are more frequent and for slightly larger quantities.

We quote warehouse prices f.o.b. Buffalo as follows: Structural shapes, 2.90c.; plates, 2.90c.; plates, No. 8 gage, 3.50c.; soft steel bars and shapes, 2.80c.; hoops, 3.50c.; blue annealed sheets, No. 10 gage, 3.30c.; galvanized steel sheets, No. 28 gage, 5.05c.; black sheets, No. 28 gage, 4.05c.; cold rolled strip steel, 6.40c.

Coke.—Several sizable inquiries not confined to blast furnace interests but commercial users are noted. There is a tendency to cover future needs, but this business is not particularly acceptable to the sellers. All sales are spot.

Old Material.—Three local mills are buying heavy melting steel and paying $13. Dealers look for an advance based on the fact that other points will pay more. A fair demand for hydraulic compressed has

appeared in several offices and feeling generally has taken on a more optimistic turn.

We quote dealers' asking prices per gross ton f.o.b. Buffalo as follows:

Heavy melting steel	$13.00 to $13.50
Low phos., 0.004 and under	14.50 to 15.50
No. 1 railroad wrought	12.00 to 13.00
Car wheels	13.00 to 14.00
Machine shop turnings	4.00 to 5.00
Cast iron borings	4.00 to 5.00
Heavy axle turnings	8.00 to 9.00
Grate bars	8.00 to 9.00
No. 1 busheling	9.00 to 10.00
Stove plate	11.00 to 12.00
Bundled sheet stampings	6.00 to 7.00
No. 1 machinery cast	14.00 to 15.00

St. Louis

ST. LOUIS, Aug. 30.

Pig Iron.—A further improvement is noted in the demand for pig iron. This has been followed by an advance of $1 a ton, and a firm stand by producers to sell only at the market price. Some orders at the old prices have been declined. Inquiries this week include one for 1500 tons for immediate shipment, another for 1300 tons for delivery during the remainder of the year, and another for 300 tons. In addition, one concern has scattering inquiries involving about 2500 tons. Most orders that are being placed are for immediate shipment and buyers are demanding car numbers at once, so that shipments can be traced. The gray iron foundries are nearly all operating, a conservative estimate being 40 to 50 per cent of normal. The St. Louis Coke & Chemical Co., Granite City, banked its furnace on Thursday, with about 9000 tons on yard, most of which is less than 2.25 per cent in silicon.

We quote delivered consumers' yards St. Louis as follows, having added to furnace prices $2.80 freight from Chicago, and $5.74 from Birmingham:

Northern foundry, sil. 1.75 to 2.25	$23.88
Northern malleable, sil. 1.75 to 2.25	23.88
Basic	23.88
Southern foundry, sil. 1.75 to 2.25	24.74

Coke.—There is more buying of coke, and the market is stronger. Standard Connellsville foundry coke is 50c. higher at $4.50 to $5 per net ton at ovens and Wise county at $6. Local and nearby melters are operating on a larger scale, and such purchases as they make are for immediate shipment with eager calls for delivery at once. There is an improvement in the demand for domestic coke.

Finished Iron and Steel.—There seems to be lessening of interest this week in finished iron and steel. There were no sales to speak of, and the only inquiry of note was for 3000 kegs of track spikes from the Missouri Pacific Railroad for St. Louis delivery. A slight improvement in warehouse business during August as compared to July is reported, the business being mostly in sheets. Warehouse prices of sheets are lower, being the only change in prices.

For stock out of warehouse we quote: Soft steel bars, 2.87½c. per lb.; iron bars, 2.87½c.; structural shapes, 2.97½c.; tank plates, 2.97½c.; No. 10 blue annealed sheets, 3.47½c.; No. 28 black sheets, cold rolled, one pass, $4.50c.; cold drawn rounds, shafting and screw stock, 4.20c.; structural rivets, 3.77½c. per 100 lb.; boiler rivets, 3.87½c.; tank rivets, 7/16 in. and smaller, 60-10 per cent off list; machine bolts, large, 55 per cent; small, 60 per cent; carriage bolts, large, 50-5 per cent; small, 55 per cent; lag screws, 60 per cent; hot pressed nuts, square or hexagon blank, $3.25; and tapped, $3.00 off list.

Old Material.—Activity in old material is near the vanishing point, but the market is in many respects stronger than a week ago, and nearly all grades have advanced 50c. per ton, despite lack of demand displayed by consumers. Rolling mill grades are quiet, and relaying rails have fallen off to a considerable extent. Heavy melting steel is not in demand, although some consumers are willing to take on tonnages at about $1 per ton under the present market. The following railroad lists are before the market this week: Wabash, 150 tons; Minneapolis, St. Paul & Sault Ste. Marie, 200 tons; open lists issued by the Cleveland, Chicago, Cincinnati & St. Louis, closing on Aug. 30, and New York Central, closing Sept. 8.

We quote dealers' prices, f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails	$13.00 to $13.50
Steel rails, re-rolling	12.00 to 12.50
Steel rails, less than 3 ft.	11.00 to 11.50
Relaying rails, standard section	29.00 to 30.00
Cast iron car wheels	12.00 to 12.50
No. 1 heavy railroad melting steel	10.50 to 11.00
No. 1 heavy shoveling steel	9.50 to 10.00
Ordinary shoveling steel	9.00 to 9.50
Frogs, switches and guards, cut apart	10.50 to 11.00
Ordinary bundle sheet	4.00 to 4.50
Per Net Ton	
Heavy axle and tire turnings	5.50 to 6.00
Iron angle bars	11.00 to 11.50
Steel angle bars	9.00 to 9.50
Iron car axles	16.50 to 17.00
Steel car axles	12.50 to 13.00
Wrought iron arch bars and transoms	13.00 to 13.50
No. 1 railroad wrought	10.00 to 10.50
No. 2 railroad wrought	9.50 to 10.00
Railroad springs	10.50 to 11.00
Steel couplers and knuckles	10.50 to 11.00
Locomotive tire, 42 in. and over, smooth inside	9.00 to 9.50
No. 1 dealer's forge	6.00 to 6.50
Cast iron borings	5.50 to 6.00
No. 1 busheling	9.50 to 10.00
No. 1 boilers cut in sheets and rings	6.00 to 6.50
No. 1 railroad casts	12.50 to 13.00
Stove plate and light cast	11.50 to 12.00
Railroad malleable	9.50 to 10.00
Agricultural malleable	9.00 to 9.50
Pipes and flues	7.00 to 7.50
Heavy railroad sheet and tank	6.00 to 6.50
Light railroad sheet	3.00 to 3.50
Railroad grate bars	8.50 to 9.00
Machine shop turnings	4.00 to 4.50
Country mixed iron	7.00 to 7.50
Uncut railroad mixed	8.00 to 8.50
Horseshoes	10.50 to 11.00
Railroad brake shoes	8.50 to 9.00

Cleveland

CLEVELAND, Aug. 30.

Iron Ore.—There is no activity in the ore market. A few consumers will probably have to buy some small lots before the close of the season of navigation but are not expected to come in the market before October. In view of the expected reduction in prices next year and probable lower freight rates, these consumers will buy only enough ore to carry them over until the opening of navigation next year. Lake Superior ore on hand at furnaces and Lake Erie docks Aug. 1 was approximately 32,600,000 gross tons as compared with 27,900,000 tons on the same day a year ago. Furnace stocks on Aug. 1 amounted to approximately 23,800,000. The consumption of Lake Superior ore during July was about 1,200,000 tons as compared with 1,470,000 tons during June.

We quote delivered lower lake ports: Old range Bessemer, 55 per cent iron, $6.45; Old range non-Bessemer, 51½ per cent iron, $5.70; Mesabi Bessemer, 55 per cent iron, $6.20; Mesabi non-Bessemer, 51½ per cent iron, $5.55.

Pig Iron.—The market was more active during the past week than for some time. One lake furnace interest sold 7000 to 8000 tons of foundry and malleable iron, mostly the former, in lots of from a carload up to 1000 tons. Another Cleveland interest sold 5000 to 6000 tons during the week, including 2000 tons of No. 2 foundry iron for prompt shipment at $20 to an Ohio pipe foundry and 700 tons of gray forge iron at the same price. One Valley furnace which has stiffened up somewhat on prices reports the sale of two lots aggregating 200 tons at $21. Sales reported include 1000 tons of malleable iron taken by a Detroit consumer. The spurt in buying is attributed to the fact that some foundries have run out of iron. There is no indication that the increased activity will keep up, as few inquiries are now pending. The only inquiries of any size reported is one for 250 tons of foundry iron from the Union Radiator Co. and one for 500 tons of malleable iron. The basic iron market is quiet and the price has not yet been established at $20, which is being quoted by several producers. Basic iron held by brokers can be purchased at $19 and probably at $18.50 or lower. Some of the Southern producers are a little firmer on foundry iron and small lot sales were

reported at $19, Birmingham, for 1.75 to 2.25 for silvery iron. The usual differential now named by Southern producers for 2.25 to 2.75 silicon iron is 50 cents. The Hanna Furnace Co. will blow in its Cherry Valley furnace at Leetonia, Ohio, Sept. 7 on basic iron.

We quote delivered Cleveland as follows, based on the new freight rate, there being a 56c. switching charge for local iron, a $1.96 freight rate from Valley points, a $3.36 rate from Jackson and $6.67 from Birmingham:

Basic	$20.46 to $20.96
Northern No. 2 fdy., sil. 1.75 to 2.25	20.50 to 21.00
Southern fdy., sil. 2.25 to 2.75	26.37
Ohio silvery, sil. 8 per cent	30.86
Standard low phos., Valley furnace	36.00 to 36.25

Semi-Finished Steel.—Sheet bars are commonly quoted at $30, Youngstown. Sheet mills are buying only in small lots to take care of orders on their books. While slab prices are not as clearly established as sheet bars, it is understood that a Youngstown mill will quote $29 on slabs, making the usual $1 differential below sheet bars.

Finished Iron and Steel.—Following an improvement in orders noted a week ago, the demand for finished iron and steel fell off during the past week, but the total volume of business during August will show a fair gain over July. Buying is almost wholly in small lots for immediate delivery to replenish stocks. Keen competition has resulted in further price concessions. Steel bars, which for some time resisted efforts of buyers to force prices down, have finally weakened and can now be bought at 1.65c., although some mills are still quoting 1.70c. to 1.75c. Plates, on which competition is sharpest, have further declined, 1.70c. now being the common quotation as compared with 1.75c. a week ago, but a buyer can secure a 1.65c. price on a round lot order. On structural shapes, minimum quotations range from 1.70c. to 1.75c. Hard-steel reinforcing bars are quoted at 1.65c. to 1.70c. Building work shows some improvement. The American Bridge Co. has taken a warehouse at Manistee, Mich., requiring 1000 tons. Cleveland has taken bids for four school buildings requiring 900 tons of structural material and Elyria has taken bids for two school houses requiring 400 tons. The Cuyahoga County Commissioners, Cleveland, have taken bids for a bridge requiring 180 tons, and bids have been taken for the Eagles' office building, Alliance, requiring 300 tons. Inquiry is out for a stadium for the Detroit baseball park requiring 500 tons of structural material and 200 tons of reinforcing bars. Some price shading is reported on plain wire, but nail prices are reported firm.

Sheets.—The demand for sheets has quieted down and prices have weakened. Common quotations low are 2.75c. for black sheets, 2.25c. for blue annealed and 3.75c. for galvanized sheets, these apparently being minimum quotations.

Warehouse Business.—Jobbers have again reduced prices $3 a ton on blue annealed sheets and $5 a ton on galvanized sheets. Other warehouse prices are unchanged.

Jobbers quote steel bars, 2.64c.; plates and structural shapes, 2.74c.; No. 9 galvanized wire, 3.50c.; No. 9 annealed wire, 3.25c.; No. 28 black sheets, 4c.; No. 28 galvanized sheets, 4.75c.; No. 10 blue annealed sheets, 3.10c.; hoops and bands, 3.29c.; cold-rolled rounds, 3.85c.; flats, squares and hexagons, 4.35c.

Coke.—Sales of foundry coke are still limited to car lots. Quotations on standard brands of Connellsville foundry coke range from $4.25 to $4.75 at oven, with most producers asking $4.50.

Bolts, Nuts and Rivets.—Manufacturers report an improvement in small lot orders for bolts and nuts. Consumers, however, are apparently buying only enough to take care of their regular requirements and orders from jobbers are for small lots to round out their stocks. Prices appear to be holding somewhat better than they have been recently. Prices on semi-finished hexagon nuts show some irregularity. The leading local producer is still adhering to 2.50c. for structural rivets and 2.60c. for boiler rivets and reports some carlot sales at these prices. Rivet quotations have appeared as low as 2.25c. for structural and 2.35c. for boiler for desirable orders.

Old Material.—Mills are buying small lots of scrap that they can secure at their prices and in the aggregate consumers have purchased during the past week or two considerable material in heavy melting steel, compressed steel, borings and turnings. Present prices are regarded as low as compared with pig iron prices and some consumers are evidently using more than the usual amount of scrap in their open-hearth furnaces. Dealers also are in the market for scrap for yard stocks. However, the supply is light and the market has a firm undertone. Some dealers believe that should a mill come into the market for a round tonnage of heavy melting steel, the price would jump to $15. Quotations are unchanged.

We quote per gross ton delivered consumers' yards in Cleveland and vicinity as follows:

Heavy melting steel	$12.25 to $12.75
Steel rails, under 3 ft	12.75 to 13.25
Steel rails, rerolling	14.25 to 14.75
Iron rails	11.00 to 12.00
Iron car axles	18.00 to 19.00
Low phosphorus melting scrap	12.50 to 13.00
Cast borings	7.25 to 7.75
Machine shop turnings	6.00 to 6.50
Mixed borings and short turnings	7.00 to 7.50
Compressed steel	8.00 to 8.25
Railroad wrought	12.00 to 12.50
Railroad malleable	12.00 to 12.75
Light bundled sheet stampings	4.50 to 5.00
Steel axle turnings	9.25 to 9.75
No. 1 cast	16.00 to 16.50
No. 1 busheling	7.50 to 8.00
Drop forge flashings, over 10 in.	5.50 to 6.00
Drop forge flashings, under 10 in.	6.00 to 6.50
Railroad grate bars	12.75 to 13.00
Stove plate	13.00 to 13.25
Pipes and flues	6.50 to 7.50

Philadelphia

PHILADELPHIA, Aug. 30.

The price tendency seems to be as follows: Raw materials, such as pig iron and old material, upward, and finished steel, downward. Some furnaces have raised pig iron prices 50c. during the week and another similar advance is contemplated by some after Labor Day. The market is settled at present at either $19.50 or $20 for No. 2 plain, the latter being the more general figure. No sales have been noted at less than $19.50 during the past week. A sizable inquiry for next year delivery has come into the market, though skepticism is expressed as to whether any furnace will quote so far in the future.

Very little business has come forth in finished steel and all who quote nominal prices admit that an attractive tonnage would bring out some vigorous cutting by the mills. Bids will be opened next month for 1000 tons of steel for a theater in Philadelphia. One inquiry calls for 2000 tons of plates to be made into storage tanks for an oil company. The railroads are among the chief buyers for car repair work, but only for small tonnages.

Pig Iron.—Price tendency is still upward, as more furnaces quote $20 for No. 2 plain and less name the $19.50 figure. One furnace which has been an active seller, parting with considerable iron at $18.50 two weeks ago, is now asking $19.50 and seriously contemplates a raise to $20 after Labor Day. Two reasons are advanced for the stiffening of the market: One, because the recent flurry of business has satisfied furnaces for the time being; the second, because sellers are convinced that as much iron will be sold under higher prices as under lower at this time. It is expected that the next two weeks will see less business, as is natural after a flurry like that of the past two weeks. One merchant disposed of 6000 tons of foundry iron last week, one being a sale of a 2000-ton lot, another of a 1000-ton lot, the rest in smaller amounts. There are two current inquiries for 400 tons of No. 1X, each, one from Reading and the other from New Jersey. One inquiry for 1000 to 1500 tons of foundry iron comes from a consumer in northern New Jersey, who recently bought iron for the remainder of the year delivery, this additional inquiry specifying delivery the first quarter of next year. It is not believed that furnaces will quote for so long in the future. No recent sales have been made of basic, though sellers claim that $19, furnace, would be insisted upon. A car of gray forge was sold at $19.50, furnace, the seller admitting that $1 lower might be named on a larger tonnage. Sellers find some relief in the fact that the market has become so stabilized

that there are practically only two market prices: $19.50 and $20 for No. 2 plain and $20 and $20.50 for No. 2X. An Eastern merchant furnace which has been continuously in blast all this year has received since June 15 about twice as many orders as were taken during the entire period from Jan. 1 to June 15, and the tonnage sold since June 15 is three or four times that sold from Jan. 1 to June 15. This furnace has shipped about 4500 tons of iron within the past week and during the past four weeks its shipments have averaged close to 1900 tons a week. In the preceding month, the shipments from the same furnace averaged slightly over 1000 tons a week. These figures illustrate the gain in pig iron buying in the East within the past few weeks.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia, and include freight rates varying from 84 cents to $1.54 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$20.34 to $21.26
East. Pa. No. 2X, 2.25 to 2.75 sil.	20.84 to 21.76
Virginia No. 2 plain, 1.75 to 2.75 sil.	28.74
Virginia No. 2X, 2.25 to 2.75 sil.	29.24 to 29.74
Basic deliv. eastern Pa.	19.00
Gray forge	20.00 to 21.00
Malleable	20.00 to 21.00
Standard low phos. (f.o.b. furnace)	36.50
Copper bearing low phos. (f.o.b. furnace)	35.00

Ferroalloys.—A sale of 60 tons of British ferromanganese was made Tuesday at $65, Baltimore, which price represents the market for imported material. Domestic producers strive to get $65, furnace, for this material, which means $70 or $75, delivered, depending on the destination. Spiegeleisen is generally quoted at $27. Inquiries and orders are increasing.

Semi-Finished Steel.—Recent sales in small quantities have established the prices of $30 for rerolling billets and $35 for forging quality, Pittsburgh. Sellers state these prices would be shaded in case of attractive tonnages.

Plates.—Though 1.85c., Pittsburgh, is nominally quoted universally, all admit that attractive business would bring out considerably lower figures. One maker names 1.75c. for sales in carloads and 1.85c. for less tonnages. Plates were bought by a railroad at 1.75c., eastern Pennsylvania mill, the practice of disregarding the Pittsburgh base becoming more popular as a means of shading prices. The Philadelphia & Reading bought 200 tons of plates recently and is now inquiring for 135 tons of tank plates. The Petroleum Iron Works is asking for 2000 tons of plates to be made into tanks for the Sinclair Oil Co. Some Southern railroads, including the Chesapeake & Ohio, the Norfolk & Western, the Western Maryland and the Seaboard Air Line, have been asking for car repair material, including plates, the last-named road to open bids on 400 tons of steel during the first week of September. It is estimated that the Stanley Theater in Philadelphia will take 150 tons of plates and that a bridge in Trenton, N. J., will need a fair tonnage.

Structural Material.—There is considerable future business in sight, judging by the data being gathered by architects and builders. The Stanley Theater, Philadelphia, will need about 1000 tons of steel, bids to be opened Sept. 15. The Southard Street bridge at Trenton, N. J., will require 540 tons of steel, bids to be opened Sept. 6. Those who have quoted 1.85c. for shapes have lost the business to competitors willing to make concessions. The practice of quoting f.o.b. eastern Pennsylvania mill is prevalent.

Warehouse Business.—Small price cuts have been made in four items, including iron bars. Inquiries and orders are fairly satisfactory, considering the depressed state of the steel industry.

Soft steel bars and small shapes, 2.75c.; iron bars (except bands), 2.50c.; round edge iron, 2.80c.; round edge steel, iron finish, 1½ in. x ½ in., 3.05c.; round edge steel planished, 3.80c.; tank steel plates, ¼-in. and heavier, 2.85c.; tank steel plates, 3/16-in., 3.035c.; blue annealed steel sheets, No. 10 gage, 3.25c.; light black sheets, No. 28 gage 4.25c.; galvanized sheets, No. 28 gage, 5.25c.; square twisted and deformed steel bars, 2.75c.; structural shapes, 2.85c.; diamond pattern plates, ¼-in., 4.60c.; 3/16-in., 4.785c.; ¼-in., 4.96c.; spring steel, 4.10c.; round cold-rolled steel, 4.20c.; squares and hexagons, cold-rolled steel, 4.70c.; steel hoops, No. 13 gage and lighter, 3.65c.; steel bands, No. 12 gage to 3/16-in., inclusive, 3.40c.; iron bands, 3.90c.; rails, 2.75c.; tool steel, 8c.; Norway iron, 5c.; toe steel, 4.50c.

Bars.—There is not so much softness as in the case of plates and shapes. The openly quoted price is 1.75c., Pittsburgh, though worth-while business would be transacted at 1.70c. There is better demand for reinforcing bars than for plain. The marine terminal at Wilmington, Del., will need 2000 tons of reinforcing bars, it is reported, an inquiry for 210 tons being now in the market. Railroads are the chief buyers for repair puposes.

Sheets.—Actual sales have established 2.25c., Pittsburgh, as a price for blue annealed sheets, with black quoted at 2.75c. A consumer who claimed he could buy the former at 2.15c. was glad to cover at 2.25c. Galvanized sheets are quoted at 3.75c.

Bolts, Nuts and Rivets.—The volume of inquiries is improving, the chief business being from railroads, particularly the Philadelphia & Reading. An attractive tonnage is expected to be asked for the marine terminal at Wilmington, Del.

Old Material.—The present is a restricted market—there are few buyers but rising prices. Though some heavy melting steel was purchased by a steel mill for $11.50, this comparatively low price was the result of the close proximity of the material to the plant. Otherwise higher prices would have been paid. The higher prices being paid by a prominent New York broker have had the effect of making the price tendency upward. The price of bundled sheets was raised 50c. when a company paid $9, delivered. Four hundred and fifty tons of relaying rails was purchased for the marine terminal at Wilmington, Del., for $38.

No. 1 heavy melting steel	$11.50 to $12.50
Scrap rail	11.50 to 12.50
Steel rails, rerolling	15.00 to 15.50
No. 1 low phos., heavy 0.04 and under	17.00 to 18.00
Car wheels	17.00 to 17.50
No. 1 railroad wrought	14.00 to 15.00
No. 1 yard wrought	12.50 to 13.00
No. 1 forge fire	10.00 to 10.50
Bundled sheets (for steel works)	8.00 to 9.00
No. 1 busheling	11.50 to 12.00
No. 2 busheling	10.00 to 11.00
Turnings (short shoveling grade for blast furnace use)	8.00 to 8.50
Mixed borings and turnings (for blast furnace use)	8.00 to 8.50
Machine-shop turnings (for rolling mill and steel works use)	8.00 to 8.50
Heavy axle turnings (or equivalent)	9.00 to 9.50
Cast borings (for rolling mills)	9.00 to 9.50
Cast borings (for chemical plants)	No market
No. 1 cast	17.00 to 18.00
Railroad grate bars	12.50 to 13.00
Stove plate (for steel plant use)	12.00 to 12.50
Railroad malleable	15.50 to 16.50
Wrought iron and soft steel pipes and tubes (new specifications)	13.00 to 13.50
Iron car axles	No market
Steel car axles	No market

Fabricating in Transit Privilege Approved

BIRMINGHAM, ALA., Aug. 30.—The Southeastern Freight Rate Committee to-day approved the fabricating in transit privilege on steel fabricated in Birmingham and other Southeastern points and recommended that all Southeastern carriers at once publish the same. Users of Pittsburgh and Youngstown steel will save $4 to $8 a ton. Chattanooga, Atlanta and other cities also get the privilege. The Louisville & Nashville and Southern railroads recommended this action to the freight rate committee.

Large Plate Tonnages Pending

YOUNGSTOWN, OHIO, Aug. 30.—District makers are figuring on two inquiries for plates aggregating 20,000 tons. Mexican oil interests are seeking 17,000 tons and the Baldwin Locomotive Co. the remainder. It is expected the larger tonnage will test the plate market and establish substantially lower prices than current quotations in case the business is placed.

The Cambria Steel Co. last Friday night turned on the blast at one of its idle blast furnaces at the Franklin works, Johnstown, Pa. This gives the company three active furnaces out of 11. It is stated that the putting on of this furnace was necessary because it was desired to build up the stocks of Bessemer steel. The Bessemer plant and a 48-in. blooming mill went on this week.

Steel Makers Heard in Metal Tariff

(*Continued from page* 539)

eastern steel plants at prohibitive prices. This is due to the high freight costs which will necessarily be charged.

"3. The Washington producer does not need protection to insure prosperity. The fact that the Washington production increased from 715 tons in 1916 to 222,000 tons in 1920 with magnesite on the free list is sufficient proof of the above statement.

"4. A heavy duty on magnesite will certainly tend to force steel makers to use dolomite as a refractory and the use of magnesite will tend to decrease.

"Ferrosilicon is mentioned especially as showing the very high duties proposed on some of the ferroalloys. At present the price of a domestic 50 per cent ferrosilicon is $60 per gross ton at Ohio points. A 50 per cent ferrosilicon means that it contains 50 per cent of silicon, therefore, a gross ton contains 1,120 lb. The duty proposed in the bill is 2½c. per lb. of silicon or for this grade, a duty of $28 per ton is proposed. This is nearly 50 per cent of the present selling price.

Iron and Silica Abundant Everywhere

"The materials entering into ferrosilicon are iron and silica, which are both abundant in all parts of the world. While a moderate duty might be advisable, we believe one that approximates 50 per cent of the selling price is excessive."

General Statement by John A. Topping

CHAIRMAN John A. Topping of the Republic Iron & Steel Co., spoke for the following independent manufacturers of steel:

Republic Iron & Steel Co.
Bethlehem Steel Co.
Midvale Steel & Ordnance Co.
Youngstown Sheet & Tube Co.
Jones & Laughlin Steel Co.
Brier Hill Steel Co.
Pittsburgh Steel Co.
Sharon Steel Hoop Co.
Interstate Iron & Steel Co.
Lackawanna Steel Co.
Gulf States Steel Co.
Inland Steel Co.
Lukens Steel Co.
Wheeling Steel Corporation.
Steel & Tube Co. of America.

Below is given Mr. Topping's statement nearly in full. Accompanying data as to foreign and domestic wages in iron and steel works, and rail and water freights on finished products will be published later.

As to the importance of the interests I represent, it is common knowledge, that the Iron and Steel business is the largest single industry in the world. The census report of the United States for 1914 credits the Steel Industry with a capital investment of nearly $4,300,000,000, with an annual payroll of over $723,000,000, and a total value of products of $3,223,000,000. Since 1914, under the stimulus of war demand the steel ingot capacity of this country was increased from about 40,000,000 tons to 55,000,000 tons, or an increase of about 37 per cent. Calculated on this increase, the present total number of steel employees, under full operations, would closely approximate 1,500,000 people, with an annual payroll of close to $1,000,000,000, based on the 1914 wage rates. This total payroll however, calculated on present wage rates, would bring the total annual wage disbursements to approximately $1,500,000,000, and the total value of products to approximately $3,500,000,000. As a result of this rapid growth in production, which was over-stimulated by war requirements, it is commonly agreed that the present productive capacity of the United States is in excess of its normal requirements. Therefore, if labor is to receive full employment hereafter, it will not only be important for us to maintain home demand at 100 per cent, but to seek an outlet for part of our surplus production in foreign markets. To make such a program possible, it will be necessary to minimize our cost of production in every possible manner, and to do this it will require the fullest co-operation, not only of capital and labor, but of the Government, the railroads and the shipping interests, if we are to hope for any success in foreign fields.

Must Export 20 Per Cent of Steel

During recent years the average export tonnage sold of iron and steel represented about 10 per cent of our total output. I think under conditions at home, it will now be necessary for us to export 20 per cent of our present capacity. These figures, I believe, are conservative, and seem to me to emphasize the importance of making every possible effort, Governmental and otherwise, for the protection of domestic trade, and for the promotion of foreign trade.

The steel manufacturers, when they discussed informally schedule 3 with the sub-committee of the Ways and Means Committee of the House of Representatives, indicated our willingness to accept both a classification and rates of duty under schedule 3 which averaged somewhat below the Payne-Aldrich schedule, but clearly stated that in so doing we must have the Payne-Aldrich free list unimpaired in the new tariff schedule, and must have as a further measure of protection some reasonable provision against dumping and other unfair practice, and also that provision should be made for reciprocity agreements for the encouragement of foreign trade.

We are strongly opposed to a number of paragraphs under several schedules of H. R. 7456, but we are in full accord with many of its general provisions. We are opposed to paragraph 1680 of schedule 15, and ask that this item be stricken out, and that barbed wire be placed where we think it properly belongs under schedule 3 and made dutiable, for the reason that there is no more justification for placing barbed wire on the free list than there would be to put any other finished iron and steel products on the free list.

We are strongly opposed to the provision of schedule 1, paragraph 47, and schedule 2, paragraph 207, also paragraphs 302, 386, 389 and 390 of schedule 3.

Our principal objection to these paragraphs is, that increased taxation is proposed on imports of these raw materials, which will materially increase our cost of production. While the cost per ton of steel, as influenced by the various items required for steel manufacture referred to in the paragraphs mentioned, might appear to be insignificant, yet they bulk large when the cumulative influence of these cost additions is considered as a total. In fact, the total increased cost, if imposed, will seriously weaken our competitive position.

We estimate, in other words, that iron and steel costs, by reason of the proposed tax on our raw materials, will be increased by the sum of approximately $24,000,000 per annum, estimated as follows:

	Annual Requirements	Proposed Tax	Tax Per Annum
Ferrosilicon 57% ad valorem.....	80,000 tons @	$37.05 per ton	$2,964,000
Fluorspar	300,000 tons @	5.00 per ton	1,500,000
Manganese ore 48%	750,000 tons @	10.75 per ton	8,062,500
Magnesite	150,000 tons @	10.00 per ton	1,500,000
Pig tin	61,949,922 lb. @	.02 per lb.	1,238,998
Zinc (first two yrs.)	426,986,416 lb. @	.02 per lb.	8,539,728
Total tax			$23,805,226

In addition to these items, further cost additions will be made on account of the proposed tax on lead. Considering the amount of lead used for roofing plate in the steel industry, the increase will add substantially to our total cost.

Aside from all questions of cost, these proposed taxes are inequitable, and cannot be supported or justified for the following reasons:

Fluorspar

Schedule 2, paragraph 207, is a mine or quarry product, the domestic supply of which principally comes from southern Illinois and northern Kentucky. This product is likewise an item of substantial importation, being imported largely by the Central Western and

Eastern steel manufacturers. The Illinois and Kentucky product, however, finds a market principally in the Central West, and other points distant from the seaboard. On account of the distance of these mines from the seaboard, and the protection which they enjoy by way of inland rates of freight, they are in no danger of foreign competition; in fact, the fluorspar interests have prospered heretofore under free trade, and there can be no possible reason for taxing the steel producers of the East at the rate of $5 per ton, or as an alternative force Eastern manufacturers to go West to obtain their fluorspar supplies, at an increased freight cost, which in many cases would exceed the amount of the duty proposed.

Magnesite

Magnesite is also a mine product, and is prepared for use by calcining or burning, the process of treatment being similar to that in the preparation of cement rock for use. Magnesite is also largely used in the manufacture of magnesite brick, paragraph 201, schedule 2. As to the fabricated magnesite or brick, the rate on this product should be relative to the duty allowed on other grades of fire brick. There can be no justification, however, for a duty on magnesite of $15 per ton, with a compensatory duty on the brick of $15 per ton, plus 10 per cent ad valorem.

The magnesite industry, like fluorspar, has prospered under free trade. The only known deposits of carbonate of magnesia, which is the rock required for calcining, and which after treatment, is called magnesite, are found in the States of Washington and California. A large business during the war was developed by the quarries in these States, and there can be no question of their ability to meet foreign competition in their natural markets, which would be St. Louis, Chicago, Pueblo and other western points where steel works are located. It would be practically impossible for imported magnesite to successfully compete with the Western producers, on account of the excessive cost for rail carriage from the Atlantic seaboard inland. This freight rate from seaboard to Chicago and St. Louis averages approximately $10 per ton, and to that extent serves as a protective tariff. But all questions aside, why should quarried burnt rock, which carries a minimum of labor cost, require more protection than mined coal, when coked, which carries a much higher labor cost in its treatment, or why should the output of a magnesite mine be entitled to any more protection than is accorded the output of an iron mine? In fact, with the general products of all of our mines and quarries on the free list, and consistently free of duty heretofore, under Republican tariff legislation, we fail to see any reason why these products should now be made dutiable.

We further claim that a duty on magnesite would be an unfair discrimination against the smaller producers of steel, in favor of the United States Steel Corporation and other manufacturers at Chicago, because these Western steel works would obtain their supplies from Western domestic mines, whereas the Eastern makers of steel would be compelled to import foreign magnesite or pay the equivalent increased cost, in the long haul from the Pacific coast to Atlantic seaboard.

The United States Geographical Survey published, under date of July 27, 1921, a statement of our domestic reserves of magnesite, the aggregate of which was 3,500,000 tons. At the present rate of consumption, this reserve will be exhausted in ten years. As one of the principal owners of this reserve is the Northwest Magnesite Co., the proposed duty will practically give it a monopoly of domestic supply of this important refractory.

Manganese

Manganese, heretofore on the free list, is even more difficult to justify now as a dutiable product. The only explanation given for the change in the schedule on manganese was recently stated on the floor of the House of Representatives, viz., that the proposed duty was for the protection of the miners in Arkansas, Montana, Georgia and Florida, but it was not stated on the floor of the House, why the miners of manganese in these States went out of business when the war ended. The reason was, not because of free trade in manganese, but because there was no market for domestic lean and high-silicon manganese ores, when the richer foreign products of Brazil, India and Russia were again available.

As a war measure, the steel manufacturers used everything and anything which would make steel suitable for Governmental purposes for the prosecution of the war. Our main idea was tonnage and service for war purposes. Cost of production was forgotten in the interest of output, but with the advent of peace economic reason quickly reasserted itself and forced the abandonment of domestic manganese ores, except for such uses as had always been our practice, of using these leaner ores for the production of spiegel. We maintain, that if the ferromanganese producer in this country is to prosper he also must have free manganese ores, or in other words have the same opportunity for obtaining and smelting the richer and cheaper ores found in foreign fields, as are available to his foreign competitor. The American producer of ferromanganese, in our opinion, is at no disadvantage with his English, Belgian and German competitors, because all these manufacturers of ferromanganese depend upon imported ores, principally obtained from India, Russia and Brazil, and the producers of ferromanganese in this country are at no more disadvantage in meeting competition than is the manufacturer of pig iron, whose industry rests largely upon domestic supplies of ore, and largely so at other points of manufacture in other parts of the world.

Ferromanganese, the product of manganese ore, is a blast furnace product, it is manganese in the pig form; in other words, it is only entitled to a relative duty to pig iron, and there can be no justification in placing a duty on ferromanganese, the finished product, relatively greater than that accorded pig iron. If this is done, based on a fair difference in cost above the metallic charge, which is about three and a half times that of pig iron which is rated for duty at $1.25 per ton, the maximum duty justified for ferromanganese would be $4.25 per ton, whereas it is proposed to tax this essential product for steel production at the rate of 2.2c. per lb. for the manganese content, or at the rate of $39.42 per ton.

The burden of this extreme tax on ferromanganese would be borne largely by the smaller steel producers of the United States, because our principal competitor, the United States Steel Corporation, owns its own manganese mines in Brazil, and also owns transportation facilities by water, and partially by land, and it manufactures its own ferromanganese from its own imported ores, because owing to its large consumption, it can afford not only to operate one but several blast furnaces for its requirements, whereas the smaller producer of steel would not consume enough ferromanganese to absorb the output of even one blast furnace; consequently the entire tax burden placed on ferromanganese would fall on him, because he must buy, rather than produce, his supplies.

Furthermore, the proposed tax on manganese ores, to any steel works importing the ores, would mean a tax on about 2.2 tons of manganese ores, the amount required to produce one ton of ferromanganese, or a total duty of approximately $23.65, whereas the smaller steel works buying the ferromanganese or finished material would pay a tax of $39.42, which in effect suggests a tax discrimination of $15.77 per ton in favor of the U. S. Steel Corporation and others who produce their own ferromanganese, which discrimination places the smaller steel works at a serious disadvantage.

Aside from all these questions of equity respecting taxes on manganese ore, it is generally conceded that our supplies of manganese ores are of exceedingly meager proportions, and lean in character, and if you place a prohibitive duty on manganese, you may force the consumer to use the domestic product, which will more quickly exhaust our reserves, and therefore, as a matter of conservation or broad Governmental policy, all of these minerals, such as man-

ganese ores, fluorspar and magnesite, should be kept on the free list, for the protection of our country in times of war, when outside sources of supply of these very essential materials required for steel production might be shut off.

Other Metals and Alloys

I particularly desire to emphasize my opposition to the ferrosilicon rate, because this item is one of large importance to the manufacturers of soft steel. The other alloys however, not specially mentioned by me, are of no less importance to the manufacturers of special steels. I do not believe it will be contended by the manufacturers of these alloys, that they employ relatively speaking either as much capital or labor as is employed by the manufacturers of steel, whose operations are more widely diversified and integrated; therefore, it is difficult for us to understand why these manufacturers of alloys need the protection they ask, or why they need even the ad valorem equivalent asked by the manufacturers of steel, which averages about 15 per cent, whereas the proposed alloy duties range from 45 per cent to 215 per cent.

As to pig tin, paragraph 386; zinc, paragraph 390, and lead, paragraph 389 of schedule 3, there can be no justification for increasing our import taxes on these products, from a protective standpoint at least. The smelting of tin ores in this country is an industry which was established on a free trade basis, and the only plants operating are located on the Atlantic coast and use imported ores. Inasmuch as tin smelters everywhere operate under equal conditions as to raw material supplies, there can be no justification for showing preferential treatment to this domestic industry, which has demonstrated its ability to live and prosper without protection.

What is true of pig tin is likewise true of zinc, lead or other raw materials, and any added cost for these materials, through increased taxation, will be directly reflected in the cost of galvanized fencing, wire, pipe, and sheet metal products generally, which are largely used on the farms, in housing construction and for household wares. Therefore, increased taxes mean increased cost of living to the great mass of our people.

Aside from these reasons, any increase in cost would be an added burden difficult to overcome, in maintaining competition for our exportable surplus, and will bear most heavily on the small steel manufacturers, because here, too, the United States Steel Corporation produces in part its own zinc supplies and imports both its pig tin and zinc in its own bottoms.

Labor Conditions

Briefly, referring to our labor and general cost conditions, I would state that owing to the upset conditions now existent throughout the world, it is rather difficult to obtain full data. I shall submit later some general information on this subject as a supplemental statement.

As a broad, general statement, however, it can be said that a day's labor in America will buy more than double the necessaries of life which can be obtained with a day's labor anywhere else in the world, and that notwithstanding recent reduction in labor costs which have taken place in the steel trade, our present wage scales in the steel industry are about 52 per cent higher than during the year 1913, while our average selling prices are only 33 1/3 per cent higher; although our cost for assembling raw materials, due to freight rate advances, are up over 100 per cent, so that to-day the selling price of pig iron at $20 per ton carries with it freight charges to the amount of $10.50 per ton. In fact, to-day, with pig iron selling at $20, the maker does not realize enough cash to return him the cost of his raw materials and freight bills, he being out of pocket as to labor cost and overhead. What is true of pig iron is likewise true of finished products made from pig iron under the iron and steel schedule.

Worst Depression in History

In other words, the iron and steel business to-day is suffering from the greatest depression it has ever experienced, and we must have cost relief in every conceivable direction. Not only must our raw materials be cheapened, but our transportation costs must be reduced, if we are to get back to normal business conditions. If our raw materials are taxed on the present schedule under H. R. 7456, we will not, owing to high costs, have adequate protection, and schedule 3 rates will have to be raised, as an alternative for taxed steel raw materials. In other words, you must give us free raw materials or increase our iron and steel schedule and revise generally the iron and steel classification.

It may be stated in this connection that the present world tendency is toward protective tariff measures, with strong preferential features. This is notably true of the British possessions, whose colonial tariffs give England a distinct advantage through imperial preferences in such important markets as Canada, Australia and South Africa.

In view of this situation we strongly indorse the bargaining clause of H. R. 7456, which empowers the President to negotiate reciprocal treaties for the promotion of foreign trade, where sufficient trade advantages can be obtained to justify tariff concessions by us.

We also heartily approve of the bounty clause in H. R. 7456 as a reasonable measure of protection to home industry against the unfair competition caused by foreign Governmental bounties in favor of foreign products.

American Valuation Favored

We strongly approve of the American valuation plan, as a prevention against fraud and under-valuation, and also because the American valuation plan provides for protection against the unfair competition brought about through a dislocation of rates of exchange, which rates are now from 25 per cent to 94 per cent discount below pre-war normal.

I would further state that without the protection of the American valuation plan, the rates of duty for iron and steel under schedule 3 of H. R. 7456 are not protective. We do not agree with the opponents of the American valuation plan, who have condemned this feature of H. R. 7456, and who claim the administrative features of the plan are not practical. We, on the other hand, believe the administrative features of this plan can be easily made operative without confusion, because we believe that it will be easier to obtain the necessary data for appraising market prices at home than it now is to obtain market prices in foreign countries.

Another feature of the American valuation clause to which I would call your attention is that under the present law of 1913 paragraph K requires that all appraisements shall be based on the actual market value and wholesale price of merchandise, at time of exportation, in the principal markets of the country from whence products have been imported, and when values cannot be satisfactorily ascertained, paragraph L of the law of 1913 provides that our appraising officers after having failed to obtain cost of production at place of exportation, may appraise such or similar imported merchandise at not less than such or similar products are actually sold or freely offered for sale in the usual wholesale quantities, in the United States in the open markets, less cost of transportation and insurance, subject to a deduction for commissions or profits not to exceed 6 to 8 per cent.

It would therefore appear that as a practical measure the present law recognizes American valuation when other methods of valuation fail, thus emphasizing our claim that American values are more easily ascertained than are values and costs in foreign countries. Therefore, why not apply the American valuation as a primary method of determining values, rather than as a last resort method, as the law of 1913 provides.

The iron and steel industry, both on account of its size and importance, as related to many other industries dependent upon it, has always been regarded as the key industry, and therefore, struggling as we are in our efforts to get back to normal, would it not be fatal to future prosperity to reverse our past tariff policy, which has given us free raw materials and prosperity, by a change so fraught with danger to business success as is now proposed?

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight Rates

Freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia	$0.35	St. Paul	$0.665
Baltimore	0.335	Omaha	0.815
New York	0.38	Omaha (pipe)	0.77
Boston	0.415	Denver	1.35
Buffalo	0.295	Denver (wire products)	1.415
Cleveland	0.24	Pacific Coast	1.665
Cincinnati	0.325	Pacific Coast, ship plates	1.335
Indianapolis	0.345	Birmingham	0.765
Chicago	0.38	Jacksonville, all rail	0.555
St. Louis	0.475	Jacksonville, rail and water	0.46
Kansas City	0.815	New Orleans	0.515
Kansas City (pipe)	0.77		

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver, the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 55c.; ship plates, 75c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 75c.; sheets and tin plates, 60c. to 75c.; rods, wire rope, cable and strands, $1; wire fencing, netting and stretcher, 75c.; pipe, not over 8 in. in diameter, 75c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in., on one or both legs, ¼ in. thick and over, and zees, structural sizes, 1.75c. to 1.80c.

Wire Products

Wire nails, $2.75 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of $1.25 and shorter than 1 in., $1.75; bright Bessemer and basic wire, $2.50 per 100 lb.; annealed fence wire, Nos. 6 to 9, $2.50; galvanized wire, $3; galvanized barbed wire, $3.40; galvanized fence staples, $3.40; painted barbed wire, $2.90; polished fence staples, $2.90; cement-coated nails, per count keg, $2.35; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days, net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 68 to 70½ per cent off list for carload lots, 67 to 69½ per cent for 1000-rod lots, and 66 to 68½ per cent for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....$2.35 to $2.50
Large boiler rivets.....2.45 to 2.60
Small rivets.....65, 10 and 10 to 65, 10, 10 and 5 per cent off list
Machine bolts, small, rolled threads,
70, 10 and 7½ per cent off list
Machine bolts, small, cut threads,
65 and 10 to 70 and 5 per cent off list
Machine bolts, larger and longer,
65 and 10 to 65, 10 and 5 per cent off list
Carriage bolts, ⅜ in. x 6 in.:
Smaller and shorter rolled threads..70 and 5 per cent off list
Cut threads.....65 and 10 per cent off list
Longer and larger sizes.....60, 10 and 5 per cent off list
Lag bolts.....70, 10 and 5 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads....60 and 10 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅝ in. x 4 in.:
Smaller and shorter.....60 and 5 per cent off list
Larger and longer sizes.....60 per cent off list
Hot pressed sq. or hex. blank nuts.....$4.60 to $5.25 off list
Hot pressed nuts, tapped.....4.25 to 5.00 off list
C.p.c. and t. sq. or hex. blank nuts.....4.60 to 5.10 off list
C.p.c. and t. sq. or hex. blank nuts, tapped. 4.25 to 4.75 off list
Semi-finished hex. nuts:
¼ in. to 9/16 in. inclusive.....80, 10 and 10 per cent off list
Small sizes S. A. E.....80, 10, 10 and 10 per cent off list
⅝ in. to 1 in. inclusive, U. S. S. and S. A. E.,
70, 10, 10 and 10 per cent off list
Stove bolts in packages.....80, 10 and 5 per cent off list
Stove bolts in bulk.....80, 10 and 7½ per cent off list
Tire bolts.....65, 10 and 10 per cent off list
Track bolts.....3.50c. to 3.75c. base

Mill Square and Hex. Head Cap Screws

½ in. and under.....70 and 10 per cent off list
9/16 in. to ¾ in.....70 and 10 per cent off list

Mill Set Screws

½ in. and under.....70, 10 and 5 per cent off list
9/16 in. to ¾ in.....70, 10 and 5 per cent off list

Rivets

Rivets, 1c. per lb. extra for less than 200 kegs. Rivets in 100-lb. kegs, 25c. extra to buyers not under contract; small and miscellaneous lots less than two tons, 25c. extra; less than 100 lb. of a size or broken kegs, 50c. extra.

All prices carry standard extras f.o.b. Pittsburgh.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $40 to $42; chain rods, $40 to $42; screw stock rods, $45 to $47; rivet and bolt rods and other rods of that character, $40 to $42; high carbon rods, $48 to $54, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes, 9/16-in. and larger, $2.50 to $2.60 base per 100 lb. in lots of 200 kegs of 200 lb. each or more; spikes, ½-in., ⅝-in. and 7/16-in., $2.75 base; 5/16-in., $2.75 base. Boat and barge spikes, $2.75 base per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh. Track bolts, $3.50 to $3.75 base per 100 lb. Tie plates, $2 per 100 lb.

Terne Plates

Prices of terne plates are as follows: 8-lb. coating, 200 lb., $11.30 per package; 8-lb. coating, I. C., $11.60; 15-lb. coating, I. C., $14.30; 20-lb. coating, I. C., $15.55; 25-lb. coating, I. C., $16.80; 30-lb. coating, I. C., $17.80; 35-lb. coating, I. C., $18.80; 40-lb. coating, I. C., $19.80 per package, all f.ob. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars, 1.60c. to 1.75c. from mill. Refined bar iron, 2.25c.

Welded Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card:

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	50½	24	⅛ to ⅜	+ 1½	+27½
¼ to ⅜	53½	27	½	31½	13½
½	58½	44	¾	37½	22½
¾	62½	50	1 to 1½	39½	24½
1 to 3	64½	52			

Lap Weld

2	56½	44	2	34½	20½
2½ to 6	60½	48	2½ to 6	37½	24½
7 to 12	57½	44	7 to 12	35½	22½

Butt Weld, extra strong, plain ends

⅛	46½	29	¼ to ⅜	+ 9½	+42½
¼ to ⅜	49½	32	½	30½	18½
½	55½	44	¾	37½	23½
¾	60½	49	1 to 1½	39½	25½
1 to 1½	62½	51			
2 to 3	63½	52			

Lap Weld, extra strong, plain ends

2	54½	43	2	35½	22½
2½ to 4	58½	47	2½ to 4	38½	26½
4½ to 6	57½	46	4½ to 6	37½	25½
7 to 8	53½	40	7 to 8	30½	18½
9 to 12	48½	35	9 to 12	25½	13½

To the large jobbing trade the above discounts are increased by one point, with extra discounts of 5 and 2½ per cent.

Boiler Tubes

The following are the discounts for carload lots f.o.b. Pittsburgh:

Lap Welded Steel		*Charcoal Iron*	
1¾ in.	21½	1½ in.	List
2 to 2¼ in.	36	1¾ to 1⅞ in.	10
2½ to 3 in.	47	2 to 2¼ in.	20
3¼ to 13 in.	52	2½ to 3 in.	25
		3¼ to 4½ in.	27

Standard Commercial Seamless Boiler Tubes

New discounts have been adopted on standard commercial seamless boiler tubes, but manufacturers are not yet ready to announce them for publication, and for that reason we publish no discounts this week.

Sheets

Prices for mill shipments on sheets of standard gage in carloads, f.o.b. Pittsburgh, follow:

Blue Annealed

Cents per Lb.		Cents per Lb.	
No. 8 and heavier	2.15	Nos. 11 and 12	2.35
Nos. 9 and 10 (base)	2.25	Nos. 13 and 14	2.45
		Nos. 15 and 16	2.55

Box Annealed, One Pass Cold Rolled

Cents per Lb.		Cents per Lb.	
Nos. 17 to 21	2.45	No. 28 (base)	2.75
Nos. 22 to 24	2.50	No. 29	2.85
Nos. 25 and 26	2.65	No. 30	2.95
No. 27	2.70		

Galvanized

Cents per Lb.		Cents per Lb.	
Nos. 10 and 11	2.75	Nos. 25 and 26	3.45
Nos. 12 to 14	2.85	No. 27	3.60
Nos. 15 and 16	3.00	No. 28 (base)	3.75
Nos. 17 to 21	3.15	No. 29	4.00
Nos. 22 to 24	3.30	No. 30	4.25

Tin-Mill Black Plate

Cents per Lb.		Cents per Lb.	
Nos. 15 and 16	2.55	No. 28 (base)	2.75
Nos. 17 to 21	2.60	No. 29	2.80
Nos. 22 to 24	2.65	No. 30	2.80
Nos. 25 to 27	2.70	Nos. 30½ and 31	2.85

Non-Ferrous Metals

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York			Lead		Zinc	
Aug.	Lake	Electrolytic	Tin New York	New York	St. Louis	New York	St. Louis
24	12.00	11.62½	25.62½	4.40	4.20	4.65	4.15
25	12.00	11.50	25.50	4.40	4.20	4.65	4.15
26	12.00	11.37½	26.00	4.40	4.20	4.65	4.15
27	12.00	11.50	...	4.40	4.20	4.65	4.15
29	12.00	11.62½	26.25	4.40	4.20	4.62½	4.12½
30	12.00	11.62½	26.75	4.40	4.20	4.62½	4.12½

New York

NEW YORK, Aug. 30.

There is very little change in any of the markets. Buying of copper is light and prices are lower. The movement in tin has been of fair proportions. The lead market continues steady and firm. Demand for zinc is still very light and prices have again eased off.

Copper.—Copper has touched new low levels in the past week, electrolytic having sold for early delivery as low as 11.37½c., New York, or 11.62½c., delivered, but only from one or two sellers. Whether this is due to the recent tendency of some holders to convert metal into cash at the end of the month is not known, but it is probably the explanation. At any rate, very little metal is now available at lower than 11.75c., delivered, with the prevailing quotation for early delivery ruling at 11.87½c., delivered, or 11.62½c., New York. Inquiry is fairly large from various sources and it is probable that if buyers could obtain the metal at their ideas of prices a fair buying movement would result, but most producers will not sell below 12c., delivered. The market for Lake copper is entirely nominal.

Tin.—Steady sales of Straits tin are reported to have been made each day in the past week in a quiet way, so that the aggregate has amounted to a fair total. Most of these sales have been made by two importers with dealers and consumers the buyers. At certain times there was a firm desire on the part of some sellers to get rid of their tin in spite of an advancing market in London. Yesterday and to-day the market has been very quiet, buying being absent because of the higher prices. Spot Straits tin is quoted to-day at 26.75c., New York. The quotations in the London market were £156 10s. for spot standard, £158 15s. for future standard and £157 5s. for spot Straits, total sales amounting to 800 tons and the market reported strong. Arrivals thus far this month have been 2500 tons, with 3340 tons reported afloat. It is stated that one American consumer bought 1000 tons direct from the Far East.

Lead.—The market is quiet and firm. A steady business is reported both by the leading interest and by outside sellers. Quotations are unchanged, that of the leading interest being 4.40c., both New York and St. Louis, and that of the outside market 4.40c., New York, and 4.20c., St. Louis.

Zinc.—Demand for zinc is extremely light and, as the result of offerings by one or two interests, prices are lower and prime Western for early delivery is quoted and has been sold as low as 4.12½c., St. Louis, and 4.62½c., New York.

Old Metals.—The market is dull and very little business is being transacted. Dealers' selling prices are nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible	11.50
Copper, heavy and wire	10.75
Copper, light and bottoms	9.00
Heavy machine composition	9.75
Brass, heavy	6.75
Brass, light	5.00
No. 1 red brass or composition turnings	7.75
No. 1 yellow rod brass turnings	4.50
Lead, heavy	3.75
Zinc	3.00
Lead, tea	3.00

Antimony.—The market is unchanged with wholesale lots for early delivery quoted at 4.50c., New York, duty paid.

Aluminum.—Virgin metal, 98 to 99 per cent pure, in wholesale lots for early delivery, is quoted by the leading producer at 24.50c., f.o.b. plant, while the same grade from importers is held at 19c. to 20c., New York, duty paid.

Chicago

AUG. 30.—While there has been some buying of all of the metals except tin, it has been of a spasmodic character. Tin, lead and antimony have declined and spelter and copper are weak. No changes are to be noted in old metal prices. We quote in carload lots, tin, 27.50c.; lead, 4.30c.; in less than carload lots, antimony, 7c. On old metals we quote: Copper wire, 7c.; crucible shapes, 7c.; copper clips, 7c.; copper bottoms, 6c.; red brass, 6c.; yellow brass, 4.50c.; lead pipe, 2.50c.; zinc, 1.75c.; pewter, No. 1, 17c.; tin foil, 18c.; block tin, 20c. All buying prices for less than carload lots.

St. Louis

AUG. 30.—There is almost no business reported. Lead is steady at 4.25c., carlots, and zinc is steady at 4.15c. We quote Lake copper at 12.48½c., to 12.73½c., carlots; tin, 26.86c.; antimony, 5.23½c. On old metals, we quote: Light brass, 3.50c.; heavy yellow brass, 5c.; heavy red brass, heavy copper and copper wire, 7.50c.; light copper, 6.50c.; block tin, 20c.; tin foil, 18c.; zinc, 2.75c.; lead, 3c.; tea lead, 2c. and aluminum, 9c.

British Makers of High Speed Steel Protest

WASHINGTON, Aug. 30.—Representing a delegation of producers of high speed steel in Sheffield, England, Arthur Balfour of Arthur Balfour & Co. appeared before the Senate Finance Committee this morning and suggested a reduction in the rates proposed in the Fordney tariff bill. In paragraph 304, Mr. Balfour said he thought the rate of duty of 20 per cent proposed on steel valued above 40c. per lb. should be reduced to 10 per cent and in paragraph 305 suggested that a compensating duty of 72c. per lb. on tungsten content should be reduced to 35c. per lb. He claimed that if the proposed rates become operative, Sheffield high speed steel makers will have the American market, with which they have long been associated, entirely cut off. He also expressed opposition to American valuation. In mentioning the depressed condition of industry and increased costs in England, the reply made by Senator Smoot was that the same condition prevails here. Senator Smoot asked if English makers would be satisfied with a tariff representing the difference in labor cost and equalizing exchange. Mr. Balfour replied they would be, provided it is not made permanent and the high tariff did not remain in effect. He said the cost of making high speed steel in England is greater than in the United States and that he earnestly hoped trading with this country would be allowed to continue so as to aid industry as well as stabilize the exchange situation.

Nickel Plant Will Close

TORONTO, ONT., Aug. 29.—The huge smelter, mines, and works of the International Nickel of Canada will close down Sept. 1, for an indefinite period, according to official announcement made at the Coppercluff, Ont., office. Operations have been curtailed to a minimum for months past and the closing down announcement was not unexpected. Business depression and the resultant piling up of heavy metallic stock, due to lack of market, is given as the reason. Six hundred employees, nearly all old hands are affected. During the war, however, upwards of 2500 men were employed.

British Iron and Steel Market

Activity Increasing—Three More Furnaces Blowing—Continental Steel Competition Hurts

(By Cable)

LONDON, ENGLAND, Aug. 30.

Fourteen Cleveland blast furnaces are now blowing, a gain of three since last week, but the general pig iron position is unchanged. Hematite is more active and supplies are scarce, but makers are not anxious to re-light their furnaces until production costs are reduced. Continental basic iron is arriving in fair quantities at £4 5s. ($15.72) ex-ship Tees.

Improvement in the British steel position is evidenced by the starting up of several works. Orders have been placed here for 50 tank steamers; also, a large contract for passenger ships is pending. Baldwin's secured a rail order for China. Home trade quotations are unchanged, but export figures are easier.

Continental semi-finished steel prices are hardening, good tonnages of sheet bars having been sold at £7 to £7 5s. ($25.90 to $26.82) c.i.f. German merchant bars are quoted by the works up to £8 10s. (1.40c. per lb.) f.o.b. German galvanized wire is being sold at £15 15s. (2.60c. per lb.) basis, for No. 8 gage, cost and freight to Japan. German wire nails can be done at 22¼s. ($4.12) cost and freight to Japan per pikul keg for December shipment. French plates are held at £8 2½s. (1.34c. per lb.) f.o.b. Merchants have sold Belgian or German merchant bars, at seller's option, at £7 15s. (1.28c. per lb.) f.o.b., for October or November shipment. Belgian wire and sheet mill output is affected by strikes.

Tin plates are easier with cheaper fuel. Eastern buying continues in fair quantities, and is the main support of the market. Sellers are asking 23½s. ($4.35) prompt and 22½s. ($4.16) f.o.b. for forward shipment. War stocks of canned foods are now liquidated, except in meats, which Russia will probably absorb. Galvanized sheets are weak, small sales having been made at £20 10s. (3.39c. per lb.) f.o.b. Wales sold to Japan specifications black sheets at £19 10s. (3.22c. per lb.) f.o.b.

We quote per gross ton except where otherwise stated, f.o.b. maker's works, with American equivalent figured at $3.70 per £1 as follows:

Durham coke, delivered	£1	15					$6.47	
Cleveland basic	7	7½	&	7	10*		27.29	& $27.75
Cleveland No. 1 foundry	7	0					25.90	
Cleveland No. 3 foundry	6	15					24.97	
Cleveland No. 4 foundry	6	10					24.05	
Cleveland No. 4 forge	5	17½					21.74	
Hematite	7	0*					25.90	
East Coast mixed	8	0	&	7	15*		29.60	& 28.67
Ferromanganese	18	0	&	14	10*		66.60	& 53.65
Rails, 60 lb. and up	10	10	to	14	0		38.85	to 51.80
Billets	8	0	to	8	10		29.60	to 31.45
Sheet and tin plate bars, Welsh	8	0	to	8	10		29.60	to 31.45
Tin plate base box	1	2½	to	1	3½		4.16	to 4.35
							C. per Lb.	
Ship plates	13	10	to	14	0		2.23	to 2.31
Boiler plates	18	0	to	19	0		2.97	to 3.14
Tees	13	10	to	14	10		2.23	to 2.39
Channels	12	15	to	13	15		2.21	to 2.27
Beams	12	10	to	13	10		2.06	to 2.23
Round bars, ¾ to 3 in.	12	10	to	13	10		2.06	to 2.23
Galvanized sheets, 24 g.	20	10	to	21	0		3.39	to 3.47
Black sheets	17	0					2.81	
Steel hoops	17	0					2.81	
Cold rolled steel strip, 20 g.	26	10					4.38	

*Export price.

GERMAN COMPETITION

No Effort to Be Made to Sell in United States—Japanese Buying Largely in Europe

NEW YORK, Aug. 30.—Representatives of German interests in New York consider that competition in iron and steel with American manufacturers, except in a few special materials, is remote. The attitude of German mill interests since the armistice and at present is explained as one of "hands off" as far as competition in the United States is concerned. They believe that any success in such trade would be only temporary, as they would be stopped by cutting of prices by American mills and special tariff barriers enacted against German materials. Added to this, according to the men in close touch with German mills, manufacturers will soon be well filled with orders for several months. Within the past week a representative of a large German interest cabled a plate inquiry of about 1000 tons to Germany and was informed that no delivery could be promised under one year on plates, as the plate mill was booked solid.

With low-priced coal and the depreciated condition of the mark in international exchange, German production costs appear at a minimum. But as coal shipments to France and Belgium in accordance with the terms of the reparations agreement are based upon the internal price of coal in Germany, an effort is being made by the Government to bring this price up by taxation. The mark is also considered by Germany to be too low in value, and an effort is being made to bring the value up to about 10 per cent of the pre-war or par value, which would be about 2.40c. per mark instead of the current rate of about 1.30c. With the value of the mark increased and coal increased in price, German prices will be considerably higher, and as the mills are rapidly filling up with orders, poor deliveries, it is held, will tend to lessen German competition in foreign markets.

While German interests at present have no intention of attempting anything resembling aggressive selling in the American market, representatives of foreign interests believe that some effort may soon be made to sell ore and other raw materials in this market when there is some recovery from the present depressed condition. At present German prices and under the prevailing exchange rates, it is stated that 60 per cent low phosphorus iron ore from German-owned Swedish fields can be put down on the Atlantic seaboard at about $6.50 per ton, and an effort may be made to sell to furnaces that are not too far inland. It is also stated that German ferromanganese can be imported to sell at $64 per ton, Pittsburgh. With a recent reduction of about 20 per cent on Swedish bar iron, high speed steel, etc., it may be possible to import some Swedish material profitably.

The Japanese market is dull, with prices of iron and steel at a low level. Much of the buying of iron and steel in Japan is being done in Germany, Belgium and other Continental markets, according to reports received by Japanese branch export houses in the United States. It is estimated by some Japanese exporters that as much as 80 per cent of the current purchases of iron and steel items are being made in Europe, with the remaining 20 per cent coming to the United States.

Among recent export sales may be mentioned about 2000 boxes of tin plate, several hundred tons of wire nails to South America, and a round lot of skelp to Europe.

For supplying information on the Peruvian import market, a Peruvian General Information Office, Calle de San Pedro 370 (Altos), Lima, Peru, has been opened by Profs. J. B. and J. A. de Lavalle, the former a lawyer and the latter an engineer. Charges will be made for information supplied, depending on the importance and the technical work required and covering such matters as the examination of industries and the handling of buying and selling. Luis Ibarra, Cinco de Mayo No. 10, Mexico, D. F., is interested in tractors, agricultural implements and road-making machinery, and wishes to receive catalogs and prices on this type of machinery, quoted f.o.b. New York.

Machine Tool Builders' Convention in October

The annual convention of the National Machine Tool Builders' Association will be held Oct. 18, 19 and 20 at the Hotel Astor, New York.

PERSONAL

Carl F. Dietz, vice-president and sales manager of the Norton Co., Worcester, Mass., has resigned to become president and general manager of the Bridgeport Brass Co., Bridgeport, Conn. He will finally sever his connection with the Norton Co., Oct. 1, when he will assume his new duties at Bridgeport. He succeeds as president Fred J. Kingsbury, of New Haven, who wishes to be relieved of some of his responsibilities and becomes chairman of the board of directors. Mr. Dietz will also be general manager. He has been connected with the Norton Co. for 10 years, first as plant engineer, then as assistant sales manager, and afterward as sales manager of the wheel division of the business, and two years ago when the Norton Co. and the Norton Grinding Co. were consolidated he was made vice-president and sales manager. He was born in New York, Feb. 12, 1880, and was graduated from Stevens Institute of Technology in 1901, and subsequently took post graduate courses in the Royal Technical College, Berlin, in sciences, metallurgy and mining. Early in his career he was employed for three years at plants of the United States Steel Corporation, largely in blast furnace operation and large gas engine installations. In 1905 he engaged in development of zinc-smelting processes, and later operated a mining lease in Utah, installing a dry method for concentrating lead-silver ores. He designed and built modern ore-milling plants for the American Glue Co., as a part of its sandpaper factory at East Walpole, Mass.; Grunelli Chemical Co., Park City, Utah, where the separation of iron and zinc sulphides was the problem; and the Ozark Smelting & Mining Co., Magdalena, N. M., where zinc ore required concentration for paint making. In 1908 he joined the Minerals Separation, Ltd., London, as consulting engineer and in the interest of this company developed treatment methods at the Dunderland iron ore deposits in Norway, north of the Arctic Circle, and studied ore treatment methods for properties in Russia, Bolivia, Australia and Africa. He put into operation the San Francisco del Oro mines in Mexico, yielding complex lead and silver ores. He is a member of the American Society of Mechanical Engineers and the American Institute of Mining and Metallurgical Engineers.

Vice-President William Le Coste Neilson, foreign sales manager of the Norton Co., with headquarters in London, who is now on his way to the United States, will succeed Carl F. Dietz as sales manager of the Norton Co.

Robert B. Moir has been appointed manager of the New York branch of the W. A. Jones Foundry & Machine Co., Chicago. He will assume his new duties immediately, making his headquarters at the present sales office and transmission warehouse of this company at 20 Murray Street. Mr. Moir has been actively connected with the home office and factory for several years.

F. C. Wiese is organizing the sales department of Amplex, Inc., importer of S&N beam shears, solid steel frame combination punches and shears and Hercules angle bending machines. R. Bauer, formerly with Joseph T. Ryerson & Son, has been placed in charge of the metropolitan district.

H. E. Mandel has severed his connection with the Lindsay Chaplet & Mfg. Co., and is now general manager of the Pennsylvania Foundry Supply Co., Philadelphia.

The Columbia Steel & Shafting Co., Pittsburgh, announces that effective Sept. 1, Harwell C. Booth, has been appointed district manager of sales for New York, succeeding Edward T. Corbus, who will assume important duties elsewhere for the organization. Mr. Booth has been associated with the cold finished steel industry for a considerable period and during the last few years has been identified with this company as sales representative in Connecticut and eastern New York.

L. Norris Hall, vice-president Pennsylvania Steel Export Co., and W. W. Baker & Co., has resigned from both companies to take effect Sept. 1, and has leased a concrete warehouse at 940 North Front Street, Philadelphia, where he expects to engage in the steel jobbing business. Prior to joining the export company he served about 16 years in the Philadelphia sales office of the Carnegie Steel Co.

Frank Johnson, automotive engineer, has joined the engineering staff of the Cadillac Motor Car Co., Detroit.

At a recent meeting of the board of directors of the Hurley Machine Co., Chicago, the number of vice-presidents was increased from three to five, Edward N. Hurley, Jr., and James A. McCoy being elected to the two vacancies created. John Proudfoot, formerly assistant treasurer of the company, was elected treasurer to succeed Mr. McCoy.

F. Baackes, vice-president and general sales agent American Steel & Wire Co., Chicago, announces the appointment of H. S. Durant as sales agent and M. W. Floto assistant sales agent at the Detroit office of the company, to succeed M. Whaling and T. J. Usher, Jr., resigned.

Arthur Balfour, of Arthur Balfour & Co., and Peter Macgregor, of Sanderson & Newbould, both well-known steel manufacturers of Sheffield, England, are now in this country on a business trip.

Howard A. Coffin, formerly secretary of the Detroit Pressed Steel Co. and manager of that company's Disteel wheel division, has been elected vice-president of the White Star Refining Co., manufacturer of lubricants, with a plant in Detroit and a fuel storage warehouse in Ecorse, Mich.

J. J. Dale, president Dale Machinery Co., New York and Chicago, has removed his place of residence to the latter city. He will continue to divide his time between his Chicago and New York stores, and the latter, as heretofore, will remain the head office of the company.

Prof. A. A. Aagaard has been appointed assistant professor of steam and gas engineering in the College of Engineering, University of Wisconsin.

K. E. Steinhauer, attorney for the Federal Trade Commission, and H. G. Pickering, attorney for the Western Association of Rolled Steel Consumers, spent two days in St. Louis last week, collecting evidence for the commission's hearings in September on the Pittsburgh plus plan. Local manufacturers and fabricators were interviewed.

Ira N. Hollis, president Worcester Polytechnic Institute, Worcester, Mass., has returned to that city following a trip abroad. Dr. Hollis went to London as one of the delegation from the engineering societies of the United States chosen to present the John Fritz medal to Sir Robert A. Hadfield.

R. W. Andrews who has been with the Fairbanks Co. for the last seventeen years, the past year and half as manager of the branch at Rochester, N. Y., has resigned and is contemplating going into business.

D. D. Lewis has been appointed general manager of the Carroll Foundry & Machine Co., Bucyrus, Ohio. Mr. Lewis was formerly general manager of the Southward Foundry & Machine Co., Philadelphia, and also served as general manager of the Buckeye Engine Co., Salem, Ohio. He had also been identified at times with the Cambria Steel Co., the Jones & Laughlin Steel Co. and the Algoma Steel Co. He was associated with the late Tom L. Johnson when the latter built the Johnson steel plant at Lorain, Ohio. W. E. Matthew, who has been general secretary and manager of the Carroll company for the past year, will devote his time exclusively to the Lambert boring mill branch of the company's business and will continue to act as secretary of the company and as a member of the executive committee.

J. C. Ward, Sheffield, England, president Edgar Allen Steel Co., Inc., Chicago, and a managing director of Edgar Allen & Co., operating the Imperial Steel Works at Sheffield, is now in the United States.

Samuel Mather and W. G. Mather, Cleveland, sailed for Europe Aug. 24.

Chas. H. Kittenering, president Defiance Machine Works, Defiance, Ohio, has been appointed special representative in the United States to act for the Chinese Government in the purchase of machinery to be used in various development projects in China, including railroads, water power, canals, telegraph, etc. The Kettenering interests had previously been selected to supply motor trucks and transportation equipment for China. It is stated that a large part of the equipment required will be supplied by the Defiance Machine Works, Defiance Motor Truck Co. and the Highway Engine Co. of Defiance.

Sydney Jessop Robinson, of William Jessop & Sons, Sheffield, probably the most frequent visitor to the United States among British steel makers in the past 25 years, arrived in New York last week for a stay of three or four weeks.

OBITUARY

BENJAMIN H. JONES, president Smith & Davis Mfg. Co., St. Louis, metal beds, died in that city on Aug. 22 of a complication of blood poisoning and pneumonia after an illness of three weeks. He was 64 years old. He had been with the Smith & Davis company since he was 12 years old.

FRED ABBOTT DEXTER, founder of the Leavitt Machine Co., Orange, Mass., valve reseating machines, etc., died Aug. 26 at his home, aged 58 years.

PERCY M. FOWL, 37 years old, president Cadillac Tool Co., Detroit, died on Aug. 24, at Harper Hospital, that city. He was born in Elyria, Ohio, and went to Detroit in 1907. He was employed at various times by the Ford Motor Co., the Burroughs Adding Machine Co., and later was Detroit manager for Strong, Carlisle & Hammond. He became president of the Cadillac Tool Co. in 1917.

FRANK J. SMITH, district engineer, American Can Co., Chicago, died Aug. 21, at his home in Oak Park, Ill., aged 44. The first oil pipe line across the Panama Canal was constructed under Mr. Smith's supervision. He later had charge of the establishment of pipe lines and storage tanks in Venezuela and Cuba.

DANIEL SOLLINGER, aged 63 years, died at his home in Chicago on Aug. 24. His entire life had been spent in the iron and steel business. He was early employed at the Wyandotte Rolling Mill Co. and later at the old Bridgeport rail mill of the Illinois Steel Co. For more than 20 years he was in the employ of Robert W. Hunt & Co., engineers, Chicago, for most of which time he was in charge of inspecting rails at the South works of the Illinois Steel Co.

MICHAEL KENNEDY, secretary and treasurer Shenango Machine Co., Sharon, Pa., died at his home in that city Aug. 23. He was 53 years old and a native of Stoneboro, Pa. He took an active interest in politics and was a member of the Pennsylvania legislature during the 1909-10 term.

PETER COOPER HEWITT, scientist and inventor, died in Paris Aug. 25. He was born in New York Mar. 5, 1861, and educated at Stevens Institute and at the Columbia School of Mines. His inventions covered many fields, including evaporators, centrifugal machines, automotive details, the Cooper-Hewitt mercury vapor lamp, the static converter or rectifier, the electrical interrupter or circuit breaker, a wireless receiver, helicopter, etc. He was for a number of years vice-president of the Pequest Co., which operated the Pequest furnace at Buttzville, N. J. This furnace was built in 1874, and was dismantled a few years ago. Mr. Hewitt was a director or trustee of many enterprises, and a member of many societies and clubs, including the Engineers' Club of New York. He was a son of Abram S. Hewitt, formerly mayor of New York, member of Congress and well-known iron master of Civil War and later days, who, in an address made when the members of the Iron and Steel Institute came from England to visit the United States in 1890, predicted the doubling of the output of American pig iron every ten years.

FRANK D. MOFFAT of Frank D. Moffat & Co., New York, and New England agent for the Atlas Steel Casting Co., and the Bay City Forge Co., died at the Hotel Vanderbilt, New York, Aug. 20. His death followed a brief illness upon his return from abroad recently. He was 61 years of age and had been identified with the pig iron and coke business for many years.

ALBERT H. CHILDS, retired iron broker, died Aug. 26, at his summer home near Port Hope, Ontario. Mr. Childs was 82 years old. He was born in Pittsburgh and received his early education there, afterward going to Yale. Returning to Pittsburgh, he engaged in the iron brokerage business, from which he retired several years ago.

EDWARD A. CRAIG, manager of the export department, Westinghouse Air Brake Co., died Aug. 28, at his home in Edgewood, Pa., after a brief illness. He was born in Allegheny, Pa., 48 years ago and as a boy entered the employ of the Westinghouse Air Brake Co. as a messenger. He later became secretary to the general superintendent of the plant then located at Allegheny, then became assistant auditor, then auditor, and later manager of the southeastern district. About two years ago, when the company organized its export department, he was appointed its manager. Recently he had been appointed president of the Westinghouse Pacific Coast Brake Co., and Pacific Coast district manager of the company. It was while preparing to assume that position that the illness which resulted in his death overtook him.

JAMES SWEENEY, until 1919 treasurer of the W. H. Sweeney Mfg. Co., nickel-plate ware, Brooklyn, N. Y., died at his home in that city Aug. 23. He was born at Napanee, Ont., Canada, March 3, 1847. He retired two years ago, taking up the treasurership of the Sweeny Realty Co.

LOUIS J. GOLDMAN, president of the Cincinnati Electrical Tool Co., Cincinnati, died at his home in that city Aug. 22, aged 71. He was a national figure in Jewish activities. A son, J. Albert Goldman, is treasurer of the Cincinnati Electrical Tool Co.

ALBERT H. WINSLOW, manager of the appropriations department of the National Lamp Works plant, Nela Park, Cleveland, of the General Electric Co., was killed in an automobile accident Aug. 26. He was 56 years of age and had been connected with the National Lamp Works about 20 years.

BAYARD PHILLIPS, treasurer Phillips-McLaren Co., Pittsburgh, died at the St. Joseph Hospital, Pittsburgh, Aug. 30, following a surgical operation. Mr. Phillips was well known in Pittsburgh iron and steel and business circles, as he was secretary of the Pittsburgh Foundrymen's Association and a number of other business organizations. He was born in Glenfield, Pa., June 30, 1879. He was graduated from Washington & Jefferson College in the class of 1898 and from the medical school of the University of Pittsburgh in 1901. He practised medicine for about four years, having been company physician for the Pressed Steel Car Co. from 1902 to 1906. In the latter year he became identified with the Phillips-McLaren Co., in which his family had been interested since its organization many years ago.

The Valley Mould & Iron Corporation, Sharpsville, Pa., will resume within the next 10 days on a 50 per cent basis, after a prolonged suspension. The Shenango Furnace Co., a merchant interest, will start its No. 2 blast furnace at Sharpsville on Sept. 10.

Machinery Markets and News of the Works

HOPES FOR SEPTEMBER

Prospects Developing in August Indicate Better Business Coming

Santa Fe Has Out New List—Three Price Reductions Announced

The trade has sanguine hopes that September will be one of the best months of the year. The increased inquiries and prospective business which developed in August are responsible for that more optimistic feeling. Actual business in August was generally no better than that of July, New England reporting it the quietest month of the year, Cincinnati suggesting that with many dealers, at least, it has considerably surpassed the preceding month.

The Santa Fe is now asking for eight machine tools for its shops at Argentine, Kan., and will possibly seek more equipment for Albuquerque, N. M., and for its coast lines. The H. A. Smith Machinery Co., Syracuse, N. Y., is asking for about a dozen machines for its own prospective customers.

The Board of Education, Canton, Ohio, rejected all bids when some manufacturers wired reductions from 10 to 20 per cent, and will receive new bids Sept. 16 on a revised list of 21 machines.

Recent price reductions include the following: 20 per cent by the South Bend Lathe Works, South Bend, Ind.; 12½ per cent by an Eastern manufacturer of milling machines, drill presses, hand screw machines and profiling machines; 15 per cent by a Wisconsin maker of tool grinders.

A central Massachusetts forging company has purchased 10 used Waterbury-Farrel Foundry & Machine Co. presses and hardening and tempering equipment from Bridgeport, Conn., interests. The Hartford-Springfield Street Railway Co., Warehouse Point, Conn., bought six machines from a Springfield, Mass., concern. The International Nickel Co., New York, has bought seven gate shears for its new plant at Huntington, W. Va.

Most of the foreign inquiries come from the Far East, there being one inquiry for seven lathes for Manchuria. Belgian agents inform American tool builders that it is practically impossible to sell high grade American tools in the face of German competition.

New York

NEW YORK, Aug. 30.

While machine-tool sellers are not expecting much railroad buying this year, there is a good deal of interest in tentative preparations which the roads are making for next year. The New York Central, for example, has included about $300,000 worth of machine tools in its 1922 budget. Purchases of these machines will, of course, be contingent on the financial situation.

One of the largest transactions of the week was the purchase of seven gate shears by the International Nickel Co., New York, for its new plant at Huntington, W. Va. The order went to a Pittsburgh company. The American Sugar Refining Co. is placing orders against its recent list, now pared down to about a dozen machines, and the Durant Motor Co. continues to buy a few tools for its assembling plant at Long Island City. A few orders have been placed by Stone & Webster, Boston, for the new Fordson tractor assembling plant at Green Island, Troy, N. Y.

Foreign inquiries come almost entirely from the Far East. Such inquiries, however, are frequently duplicated, as for example, one for seven lathes for Manchuria, which has been sent out for quotations by at least four New York export houses. American tool builders are advised by their Belgian agents that it is almost impossible to sell high-class American tools in competition with the low-priced German tools.

The dull condition of the crane market in this district continues. Sales of electric overhead cranes are particularly inactive, but there is a fair volume of inquiries in the locomotive crane field, and sales of hand power cranes, although small, are considerably more numerous than the sales of electric cranes. Some business has evidently been stimulated by the lower prices now prevailing among builders of hand power cranes. An inquiry is in the market from the William Steele & Sons Co., Philadelphia, for a 6-ton, 70-ft. span bucket crane and two 3-ton overhead traveling cranes. The American Locomotive Co. has asked for quotations on a 2-ton, 40-ft. span overhead traveling crane for its Dunkirk plant. A request for bids on specification 4509 has been issued by the Bureau of Yards and Docks, Navy Department, Washington, calling for a 10-ton hand power crane for the Bureau of Mines depot, Yorktown, Va.

On the two 3-ton portal cranes for the Gowanus Canal, purchased by New York State, the lowest bid was submitted by the Lambert Hoisting Engine Co., Newark, N. J., quoting $25,590 for the two cranes; Pawling & Harnischfeger Co. quoted $25,950; Heyl & Patterson, $29,720; Manning, Maxwell & Moore, $29,900, and the Wellman-Seaver-Morgan Co., $32,800. The rumored purchase of cranes by the American Dock & Terminal Co. at Tompkinsville, Staten Island, consisted of two 2000-lb. capacity electric hoists, for warehouses, purchased from the Lidgerwood Mfg. Co. Further purchases of electric hoists may be made. Tenders on the 34 3-ton cranes for the Stapleton, Staten Island, piers being built by the city of New York for the Pan-American Terminal & Dock Co. will probably be issued in about one week by the Commissioner of Docks. The Kentucky & West Virginia Power Co. has purchased a 15-ton hand power crane from the Reading Chain & Block Corporation. The Lancaster Wrecking Co., Lancaster, Pa., desires catalogs and prices from manufacturers of crawl tread locomotive cranes.

The Wheeler Co., care of the Graham Beach Realty Co., Brooklyn, has acquired 17 lots on Coney Island Creek, Flatbush section, for the establishment of a new shipbuilding works, to specialize in the construction and repair of small vessels.

The Bernard Mailing Machine Co., New York, has been incorporated with a capital of $50,000 by J. Wile, F. McCarthy and T. Donohue, to manufacture mailing and addressing machines and parts. It is represented by Henry Hoelljes, 95 Madison Avenue.

The Fordham Plaza Auto Co., Inc., 1856 Bath Avenue, Brooklyn, is completing plans for a new three-story automobile service and repair works, 100 x 150 ft. on Webster Avenue, New York, estimated to cost about $150,000. Charles S. Clark, 443 East Tremont Avenue, New York, is architect.

The Driggs Ordnance & Mfg. Co., 19 West Forty-fourth Street, New York, is arranging equipment and facilities at its plant at New Haven, Conn., for the manufacture of lightweight automobiles and parts. Production will commence at an early date.

The Instantaneous Electric Water Heater Corporation, Brooklyn, has been chartered under State laws to manufacture electric water heaters and parts. The incorporators are L. Feinman, M. Holland and Samuel Rubinton, 32 Court Street.

The Power Driven Machine Gun Corporation, New York, has been incorporated with a capital of $100,000 by J. F. Mathias, W. D. O'Gorman and P. M. Kelly to manufacture machine guns and parts. It is represented by Hardy, Stanoliffe & Whitaker, 165 Broadway.

The International Cement Corporation, 342 Madison Avenue, New York, has arranged for a note issue of $1,500,000,

the proceeds to be used for plant improvements, operations, etc.

A. Schrader's Sons, Inc., New York, has been incorporated under Delaware laws with capital of $100,000 by M. Charles Schweinert and Phillip G. Cole, Forest Hills, N. Y., to manufacture valves, couplings and kindred products. It is represented by the Corporation Trust Co. of America, duPont Building, Wilmington, Del.

The Cowles Heater Co., New York, has been incorporated with a capital of $100,000 by H. L. Cowles, J. J. Young and J. A. Trimble, to manufacture heaters and heating equipment. The company is represented by F. A. Hutson, 41 Park Row.

Arrangements are being perfected for a merger of the General Asbestos & Rubber Co., 58 Warren Street, New York, and the Raybestos Co., Bridgeport, Conn., under the first noted name. The consolidated company will have aggregate assets of $9,615,000. The General Asbestos company operates a large plant at North Charleston, S. C., for the manufacture of brake lining and kindred products, and the Raybestos Co., in addition to the Bridgeport works, has plants at Stratford, Conn., and Peterboro, Ont. The different plants will be continued in operation. C. Bissell Jenkins is chairman of the board, and Sumner Simpson, president of the new organization.

The Havana Electric Railway, Light & Power Co., Havana, Cuba, has disposed of a note issue of $1,500,000, the proceeds to be used in part for extensions, improvements, etc., in electric power plants and system.

The Vulcano Mfg. Co., New York, has been incorporated with a capital of $50,000 by H. J. Friedman, J. M. Nimhauser and A. G. Solomon, 200 Fifth Avenue, to manufacture tools, hardware products and other metal goods.

The Manhattan Roofing Co., 133 East 118th Street, New York, has acquired a three-story building at 121 East 120th Street, on site 25 x 100 ft., and will remodel the structure for a new plant. Max Pischler is president.

The Bunnell-Stevens Co., recently organized under Delaware laws with capital of $400,000, will operate a plant at New York for the manufacture of engines and machinery. It is represented by R. D. Bunnell, 2 Rector Street.

Fire, Aug. 22, destroyed three high-pressure boilers and other auxiliary power equipment at the plant of the West Virginia Pulp & Paper Co., Mechanicsville, N. Y. The department will be rebuilt.

Schulz & Co., Inc., New York, has been chartered under State laws to manufacture machinery and parts. The incorporators are H. Schulz, I. Spencer and Charles Marks, 302 Broadway.

The New Jersey Power & Light Co., Dover, N. J., has been granted permission to acquire the Lambertville Public Service Co., Lambertville; Flemington Light, Heat & Power Co., Flemington, and the Newton Gas & Electric Co., Newton, and to issue securities in an amount of $446,300 to effect the purchases, and for plant and system extensions and improvements.

The Radio Service Laboratories, Inc., Asbury Park, N. J., has been incorporated with a capital of $50,000 by Harold M. Lewis, Hobart A. Simpson and Melvin S. Moore, to manufacture wireless and other electrical equipment. It is represented by Joseph M. Turner, 701 Mattison Avenue.

Fire, Aug. 22, destroyed the machine shop, forge shop, pattern shop, sawmill and power house at the plant of the Vulcan Iron Works, Hudson and Essex streets, Jersey City, N. J., with loss estimated at about $250,000. The company specializes in marine iron and steel construction, and is operated by the Grymes Engineering & Vulcan Iron Works Co. A. J. Grymes is president.

Matthew Walsh, Brooklyn, manufacturer of belting, has leased a three-story building, aggregating about 6000 sq. ft., at the rear of 28 Orange Street, Newark, N. J., for the establishment of a new plant.

The Kelsey Motor Co., 25 Branford Place, Newark, will break ground at once for its new plant at Belleville, N. J., on a seven-acre tract recently acquired. It will be used for the manufacture of parts and assembling.

The Kolb Sheet Metal Works, 30 Orange Street, Newark, has filed notice of organization to manufacture fans and blowers and other metal products. Norman L. Kolb, 56 Crawford Street, heads the company.

The Amalgamated Iron & Steel Co., Newark, has filed notice of organization to manufacture iron, steel and other metal products. Elwood B. Hendricks, 645 Springvale Avenue, East Orange, N. J., heads the company. The same interests have also organized the Bolt, Nut & Rivet Co. and the Brass, Bronze & Copper Co., both of Newark.

The Newark Die Co., 17 Frelinghuysen Avenue, Newark, has filed notice of dissolution under State laws.

The M. L. Copper Welding Works, Newark, N. J., has filed notice of organization to operate a plant at 207 Sixteenth Avenue. Meyer L. Levy, 125 Somerset Street, heads the company.

John L. Reid, Newark, N. J., former police commissioner of the city, and associates have organized the Proctor Typewriter Co., to manufacture a new typewriting machine and parts. Initial production will be carried out at Baltimore and arrangements are being perfected for a plant. Later it is planned to establish works at Newark.

The Trethanay Mfg. Co., 154 Wright Street, Newark, N. J., has filed notice of organization to manufacture toys, metal novelties, etc. Charles and Joseph Trethanay, 31 Lincoln Park, head the company.

New England

BOSTON, Aug. 29.

Local machine-tool houses report comparatively little business the past week. One firm sold a used six-spindle drill and a 16-in. lathe to a New Hampshire repair shop, and another two new 16-in. lathes, while here and there a new and used tool has changed hands. Indications are that August will be the smallest month this year in the amount of business booked by local selling interests. Sufficient new inquiries and prospective business, however, are at hand to warrant expectations of better market conditions next month. Since our last report a local representative of a low-priced lathe has received 10 inquiries on small equipment.

Elsewhere in New England encouragement is found in business reported. A central Massachusetts forging company has purchased 10 used Waterbury Farrel presses as well as hardening and tempering equipment from Bridgeport interests. The Hannon-Finton Co., Springfield, Mass., reports recent sales as follows: One No. 5B Becker vertical milling machine to the Schuykill Forge Co., Philadelphia; one No. 4B to the W. H. Stearns Stamping Co., Worcester, Mass.; one 36-in. x 10-ft. planer to a Chicago dealer; two No. 2 Hendee universal milling machines with vertical attachments to a New York dealer; No. 4 Landis universal grinder to a Springfield concern for regrinding automobile cylinders, the buyer purchasing an attachment for grinding crank shafts direct from the Landis company; No. 1 Norton universal grinding machine and a 14-in. grinder stand to a Northampton garage; small universal milling machine to the Rue Mfg. Co., Philadelphia, and one band saw, combination wood-working machine, bolt cutter, power hack saw, car wheel boring machine and one 20-in. drill press to the Hartford-Springfield Street Railway Co., Warehouse Point, Conn. The company is negotiating with a local metal-working concern for two vertical milling machines. The Metal Saw & Machine Co., Inc., Springfield, reports the sale of two 10 x 10-in. saws for Australia and considerable band saw business for British accounts.

Although the Bangor & Aroostook Railroad Co. has laid off for six weeks 280 men at its Derby machine shop, the New England railroad shop situation is brighter. The Bangor & Aroostook car repair shop crew is busy getting cars ready for fall traffic. All employees laid off some time ago at the East Hartford, Conn., shops of the New York, New Haven & Hartford have been taken back and the company will take on additional men at New Haven and elsewhere in the immediate future. Work at the locomotive repair shops of the Boston & Albany at West Springfield, Mass., has been resumed, approximately 200 machinists having been recalled. This railroad is in the market for a 2500-lb. single frame steam hammer and a 28-in. motor-driven shaper. The Maine Central is expected to take some action in the near future on equipment, inquiries for which were sent out several weeks ago.

The Whitin Machine Works, Whitingsville, Mass., has purchased a 2000-kw. General Electric steam turbine generator and an Alberger condenser for its power plant which is being rearranged.

The affairs of the Boston District Ordnance Salvage Board practically have been wound up. All machine tools have been taken out of the market so far as this particular branch of the Government is concerned.

The A. Burlingame Co., 149 Commercial Street, Worcester, machinist, is asking bids for the erection of two additional stories, 78 x 500 ft.

Bids are being asked on the construction of a four-story and basement printing plant, 80 x 180 ft., contemplated by the Rumford Press, Concord, N. H.

Charles E. Wilson, 198 Franklin Street, Springfield, Mass., machinist, is building a one-story shop, 40 x 100 ft., on Riverside Drive.

The Connery Machine & Tool Co., 56 Harrison Avenue, Springfield, Mass., small tools, is negotiating for property on which the erection of a small plant is contemplated.

Plans are being prepared for a one-story factory, 60 x 160 ft., with ell, 60 x 100 ft., contemplated by the Williams & Anderson Co., Providence, R. I., emblems.

The Utilities Mfg. Co., New Haven, Conn., has been formed with an authorized capital of $50,000 by T. A. Cooney, Cheshire, and J. D. Beecher and William B. Turley, New Haven. Among the products to be manufactured are can and bottle openers.

A Massachusetts charter has been granted the Saving Spring Co., Boston, to manufacture automobile springs. It is capitalized for $100,000. Thomas W. Morris is president and William P. Everts, treasurer, both at 709 Pemberton Building, Boston.

Mack Klein, 146 Shirley Avenue, Revere, Mass., is president and David Adelson, 150 Campbell Avenue, treasurer of the Century Mfg. Co., Boston, capitalized for $25,000, which has been granted a charter to manufacture automobile accessories.

The Hampton Tool Co., 238 Dwight Street, Springfield, Mass., tool maker, within the immediate future will build a one-story plant, 40 x 100 ft., at 562 St. James Avenue. Provision will be made for additional floor space when business conditions warrant. At present the company is engaged in the manufacture of a patented ice cream freezer and kindred machinery for outside interests. G. T. and P. P. Murphy are proprietors.

The Metal Saw & Machine Co., Inc., Springfield, Mass., saws and cutting-off machinery, has installed considerable heavy production tools and otherwise equipped the part of its plant formerly given over to the manufacture of hack saws, for the manufacture of high production and other special machinery for outside interests. New equipment includes monorail system on which a Franklin-Moore 1-ton electric hoist operates. Additional machine tool equipment will be installed within the next few months. The company maintains an engineering department for developing special machinery. Howard L. Washburn will supervise production.

The K. B. Noble Co., 249 Pearl Street, Hartford, Conn., manufacturer of contractors' machinery and parts, has completed plans for extensions and improvements in its plant to cost about $30,000. Buck & Sheldon, Inc., 60 Prospect Street, is architect.

The Grant Motor Radiator Works, 8 Calender Street, Providence, R. I., has filed notice of organization to manufacture automobile radiators and other metal products. Leonard W. Forest and Chester M. Grant, 718 North Broadway, East Providence, head the company.

Plans for a new one-story power plant for mill service are being prepared by Benedict Schwanda & Sons, Staffordville, Conn. It will be of hydroelectric type.

F. A. Ryer, purchasing agent Boston & Albany Railroad, Boston, will receive bids until Sept. 6 for engine truck swing frame, steam pipe flanges, trailer truck box, cylinders, valves and other equipment for locomotive rapair work.

The Worcester Electric Light Co., 11 Foster Street, Worcester, Mass., has completed plans for a two-story machine shop estimated to cost about $35,000.

The Spindle City Brass Foundry, South River Road, Lewiston, Me., is planning to rebuild the portion of its foundry destroyed by fire, Aug. 17, with loss estimated at about $10,000.

The Union Rubber Co., Inc., Calais, Me., has been incorporated with a capital of $400,000 by C. L. Lello and Harold H. Murchte, Calais, to manufacture tires, etc.

The Porcupine Co., Bridgeport, Conn., manufacturer of boilers, has awarded a contract to the T. J. Pardy Construction Co., Bridgeport, for a one-story, brick and steel addition, 148 x 240 ft., estimated to cost about $30,000.

Fire, Aug. 23, destroyed the power plant of the Lincoln County Power Co., Damariscotta Mills, Me., and the plant of the Damariscotta Leather Co., manufacturer of leather board products, with loss, including equipment, estimated at $100,000. Both properties are operated by Burgess & Lang, Boston.

The Bigelow Co., 92 River Street, New Haven, Conn., manufacturer of steam boilers, has completed plans for a one-story boiler shop addition, 53 x 105 ft. Henry R. Kent & Co., 5 Erie Avenue, Rutherford, N. J., are architects and engineers.

The Mechanical & Electrical Mfg. Co., Bethel, Me., has been incorporated with a capital of $100,000 to manufacture electrical equipment and machine products. Theodore Morin, Bethel, is president and treasurer; Ellery C. Park is secretary.

The power house and compressor plant at the works of the Wetmore & Morse Granite Co., Websterville, near Montpelier, Vt., were destroyed by fire, Aug. 17, with loss estimated at $100,000. They will be rebuilt.

Chicago

CHICAGO, Aug. 29.

The Atchison, Topeka & Santa Fe has issued an inquiry for equipment for its Argentine, Kan., shops. It is also expected to enter the market soon for additional machinery for its Albuquerque, N. M., shops, as well as for equipment for its coast lines. The Argentine list is as follows:

One heavy duty double-end 52-in. car wheel axle lathe with slip ring induction motor.

One car wheel journal truing machine with slip ring induction motor.

One 5-ft. radial drill.

One 36-in. x 16 ft. engine lathe.

One 28-in. crank shaper.

One 24-in. x 10-ft. engine lathe.

One heavy upright drill of sensitive type with capacity to drill 1½-in. steel.

One motor-driven 76-in. boring and turning mill.

All of the machines with the exception of the axle lathe, the journal truing machine and the boring mill are to be arranged for belt drive. The Santa Fe is expected to close on a number of overhead traveling cranes for Albuquerque some time this week.

The general situation in the trade has undergone little change. Inquiries, principally for single machines, are more numerous than in July, but actual buying is still light. Local dealers have received from the H. A. Smith Machinery Co., a machinery house in Syracuse, N. Y., a list including four 2¼-in. turret lathes, two 6-in. spiral bevel gear generators, two 12-in. spiral bevel gear generators, one No. 12 Barber-Colman gear hobbing machine, and two No. 70 Heald grinding machines. The company states that it has live inquiries for all the tools mentioned and that slightly used machines, or new machines, at attractive prices, will be considered.

An Eastern manufacturer of milling machines, drill presses, hand screw machines, and profiling machines has reduced prices 12½ per cent. A Wisconsin maker of tool grinders announces a reduction of 15 per cent.

The Reliable Sheet Metal Works, 1325 Belmont Avenue, Chicago has let contracts for a factory addition, 25 x 65 ft., to cost $8,000.

The J. G. Pressler Co., 326 West Madison Street, Chicago, has been incorporated with $10,000 capital stock to manufacture rubber hose, other rubber products and automobile accessories. The officers are J. G. Pressler, president; D. C. Pressler, treasurer, and R. H. Inman, secretary.

The Sterling Trap Co., 105 West Monroe Street, Chicago, has been incorporated with $5,000 capital stock to manufacture fly traps. For the present the company will merely supply the dies to be used in punching out the traps, but later expects to do its own manufacturing. The officers include Frank C. Powers, president; J. H. Clark, vice-president, and Edward J. Hess, secretary and treasurer.

The Ludlow Typograph Co., manufacturer of type setting and type casting machines, 2032 Clybourn Avenue, Chicago, has let contract for a one-story office and factory, 47 x 52 ft.

The Standard Electric Co., Hammond, Ind., has been incorporated with $25,000 capital stock to manufacture electrical equipment. The incorporators include W. R. Wermine, Ernest Freeman and Oliver W. Hershman.

The Improved Power & Machinery Co., Pueblo, Colo., is building an addition to cost $4,000.

The Pence Auto Co., Eighth Street and Hennepin Avenue, Minneapolis, Minn., has let contract for a one-story plant, 100 x 220 ft., at 2401 Broadway, to cost $65,000.

Joseph Spingola & Sons, 750 Taylor Street, Chicago, are receiving bids through A. V. Capraro, 105 North Clark Street, on a two-story garage, 75 x 120 ft., 1918 South Morgan Street, to cost $50,000.

The City Council, Carrollton, Ill., has preliminary plans under way for a new municipal electric power plant to cost about $90,000.

The Pendergast Fence Co., Fort Madison, Iowa, is having revised plans prepared for its new one-story and basement factory, 60 x 120 ft., to manufacture wire fencing.

The Coal Products Mfg. Co., Lockport Township, Joliet, Ill., will break ground at once for a two-story and basement addition, 48 x 65 ft.

The Chicago, Rock Island & Pacific Railroad Co., LaSalle Street Station, Chicago, has taken bids for its new one-story car repair shop at Trenton, Mo., 85 x 400 ft., estimated to cost about $65,000.

The Shelbyville Ice Co., Shelbyville, Ill., is planning the erection of a new ice-manufacturing plant, with initial daily capacity of about 65 tons. D. B. Isenberg is president.

The Western Metal Products Co., Joliet, Ill., has been incorporated with a capital of $50,000 by Walter B. Stewart, A. D. MacIntyre and Frederick A. Hill, 314 Barber Building, to manufacture metal goods.

Philadelphia

PHILADELPHIA, Aug. 29.

The Reid-Avery Co., 1434 Brandywine Street, Philadelphia, operating an electric welding and repair works, has leased the two-story building at Twenty-first Street and Washington Avenue, owned by the Merchant & Evans Co., for a new plant.

The Acme Iron & Metal Co., Twenty-third and Arch streets, Philadelphia, has acquired property at Twenty-fifth and Dickinson streets, 85 x 169 ft., to be used in connection with plant extension.

The Columbia Steel Equipment Co., Third and Annsburg streets, Philadelphia, manufacturer of steel filing cabinets, etc., will build a one-story addition.

John P. Smith, Inc., Philadelphia, is being organized by John P. Smith, Franklin S. Morehouse and Joseph S. Shusted to manufacture heating equipment, piping, boilers, etc. The company is represented by Leighton P. Stradley, Land Title Building. Application for a State charter will be made Sept. 19.

The John Best Lock Nut Co., Philadelphia, has been incorporated under Delaware laws with capital of $100,000 to manufacture nuts, bolts and kindred products. It is represented by F. R. Hansell, Land Title Building.

The Lutz Co., Thirty-first Street and Grays Ferry Avenue, Philadelphia, manufacturer of machinery and parts, has filed plans for a one-story foundry addition, 80 x 120 ft., at its works on Hayes Avenue, Camden, N. J. William Lutz is president.

The Superior Radiator Co., Hanover, Pa., has been incorporated with a capital of $25,000 to manufacture automobile radiators and kindred equipment. Edgar P. Wentz, Hanover, is treasurer.

The Philadelphia Rapid Transit Co., Land Title Building, Philadelphia, will soon break ground for the erection of a one-story addition to its car repair shops on Dauphin Street, estimated to cost about $50,000. Henry E. Baton, 1713 Sansom Street, has the contract.

The Harrisburg Corporation, Harrisburg, Pa., has taken over the control of the Harrisburg Foundry & Machine Works, Harrisburg, and in the future the plant will be operated under the purchaser's direction. It manufactures engines and kindred mechanical equipment. Alfred Sohland is president, and C. H. Israel, general sales manager.

The Hendrick Mfg. Co., Dundaff Street, Carbondale, Pa., manufacturer of perforated metals, screens, etc., has awarded contract to the Austin Co., Bulletin Building, Philadelphia, for a one-story addition, 100 x 220 ft., to cost about $100,000.

The Lehigh Structural Steel Co., Allentown, Pa., is considering the erection of a number of additions. It recently secured a contract for the reconstruction and repair of 200 steel hopper cars for the Lehigh Valley Railroad Co.

The Wenz Granite Quarries Co., 1141 Hamilton Street, Allentown, Pa., is installing new equipment at its plant, including polishing machinery, lathes and power plant apparatus.

Pittsburgh

PITTSBURGH, Aug. 29.

While actual business in machine tools in this district still is of very limited proportions, the tendency being to purchase only such tools as needed, the trade is encouraged by the inquiries that are coming out from time to time. A railroad list involving seven tools has just been issued, but the inquiry does not seem to have been very widely scattered and those who have it are inclined to withhold details, both as regards the name of the company and the tools wanted. This is the first railroad inquiry in several months and is looked upon as a favorable development. The movement on the part of some railroads to close their own shops and transfer repair work to private establishments, to put such work outside of the scope of the Railroad Labor Board, seems to be gaining ground and it is thought this may be productive of some business for tool builders. No price changes have come out in this district the past week. The crane market shows very little life. Several requests for prices for estimating purposes have reached local offices, but as yet nothing has been done regarding the cranes for the galvanizing plant of the Wheeling Steel Corporation, Beech Bottom, W. Va., nor for the crane which the Bessemer Gas Engine Co., Grove City, Pa., recently inquired for with one or two makers. These have been regarded as the livest inquiries before makers and awards had been expected by this time.

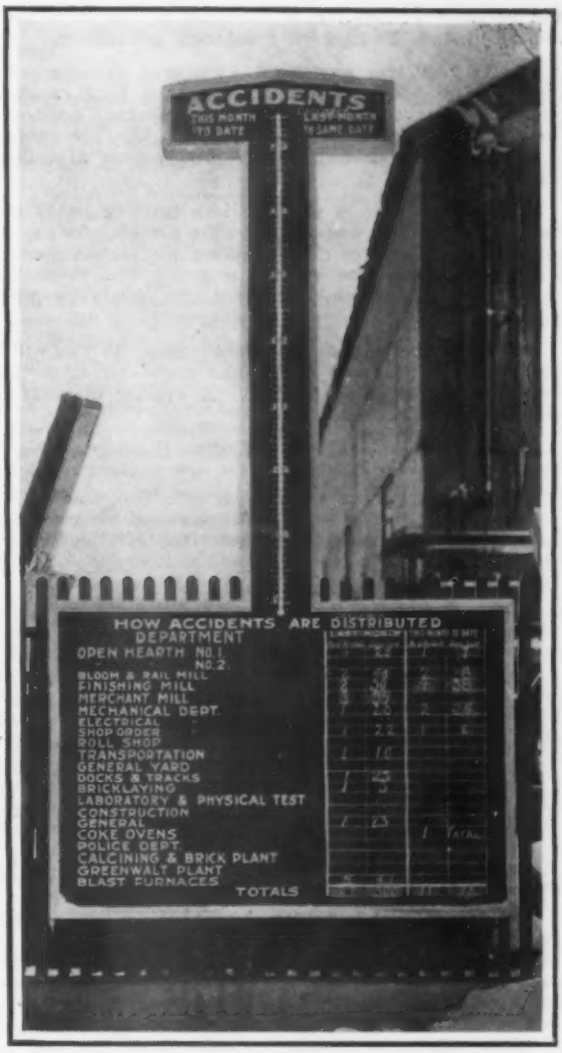
The Scientific Specialty Co., Pittsburgh, has been incorporated with a capital of $25,000 to manufacture hardware specialties, metal kitchen utensils, etc. C. D. Stewart, Crafton, Pa., is treasurer. The company is represented by C. L. McCobb, 425 Wabash Building.

The Pittsburgh Radio & Appliance Co., Pittsburgh, is being organized by Frank Feldman, Max Hirsch and Martin W. Kunkel to manufacture wireless apparatus, electric fixtures and equipment, etc. It is represented by Frank R. S. Kaplan, 922 Frick Building.

The McCrey Sanitary Collapsible Barrel Co., Apollo, Pa., has completed plans for the erection of a one-story factory, 50 x 160 ft., to cost about $42,000. It recently arranged for a change of name to the Sanitary Collapsible Barrel Co., and will maintain headquarters at Pittsburgh.

The Standard Underground Cable Co., Westinghouse Building, Pittsburgh, has awarded contract to the J. W. Cowper Co., Oliver Building, for a one-story addition to its plant on Sixteenth Street, estimated to cost about $17,000.

Plans are being completed for a new four-story power plant at the McKeesport Hospital, McKeesport, Pa., and bids



The photograph here reproduced represents an accident indicator used at the works of the Algoma Steel Corporation, Sault Ste. Marie, Canada. The accident prevention campaign has been in progress there for the past ten months. Frank J. McGue, director of safety, says that the result has been a diminution of over 50 per cent in accidents, 70 per cent in lost time and some 70 per cent in compensation.

The indicators were designed to keep every man in the plant informed every day of exactly what progress is being made in fighting accidents. The belief is that if everybody at all times be made to think of safety, greater care would always be taken and there would be fewer accidents. One of these boards is placed at every gate or clockhouse, where every man passing in or out must of necessity see it. The photograph was taken in February, and instead of the comparison being made with January, when operations were curtailed to some extent, the figures were compared with those for December, so that there would be a fair basis of camparison.

will be asked at once. It is estimated to cost in excess of $60,000. Sidney F. Heckert, Pittsburgh, is architect.

The P. Wall Mfg. Supply Co., Pittsburgh, is being organized by Frank T. Page, J. M. Irwin and H. E. Letty to manufacture galvanized iron and steel products. Application for a State charter will be made on Sept. 12. The company is represented by Calvert, Thompson & Wilson, 1737 Oliver Building.

M. B. Kelly, care of the American Steel Co., 1300 Park Building, Pittsburgh, and associates are planning for the purchase of a factory for manufacturing mechanical products, utilizing tin plate, wire, etc. It is proposed to re-establish the plant at Pittsburgh or Ellwood City, Pa. The project will represent an investment of close to $1,000,000.

The Hess Coal & Coke Co., Morgantown, W. Va., will install new electrical and mechanical equipment at its local properties to cost about $35,000. A number of plant improvements will be made.

Louis Adams and J. P. Hetherington, Huntington, W. Va., are planning the establishment of a new machine repair and electric welding works.

C. H. Craig, Charleston, W. Va., is planning for the erection of a new ice-manufacturing and refrigerating plant at Richwood, W. Va.

Ohio

Sentiment has improved somewhat in the Cleveland machine-tool market and inquiries are more plentiful. This is regarded as encouraging, although it is doubtful whether some of these inquiries will result in the early placing of orders. Local dealers report the volume of sales in August practically the same as in July. However, some improvement is expected during September. The South Bend Lathe Works, South Bend, Ind., has made a further price reduction of 20 per cent. This company states that the average prewar prices on its entire line of lathes were only 37 per cent below the quotations it has just adopted.

In Cincinnati, while no large purchases of machine tools are being made, the month of August with some makers will run far ahead of July as to the number of orders booked. While this does not mean that business is at all brisk, local manufacturers are confident that a turn for the better has come. A number of inquiries for one and two tools are before the trade which are expected to close within the next few weeks. Several Eastern railroads are inquiring for tools, but no large lists are being issued. It appears to be the policy to buy only as machines are urgently required, but manufacturers in close touch with the situation feel that with the better showing of the railroads and the prospects for increased business which now look brighter than for many months, it is only a question of a short time when new tools will be bought. In this connection it is persistently reported that a local manufacturer has secured an order for approximately 60 machines which are destined for several railroad shops.

The Board of Education, Canton, Ohio, has rejected all bids for the machine-tool equipment for the McKinley School in that city and will receive new bids Sept. 16. It is stated that before the bids were opened a number of manufacturers wired new prices, reducing their formal quotations from 10 to 20 per cent, and that the board decided to re-advertise in order to get the benefit of any lower prices that may be named. The original list has been changed and now consists of 21 machines and considerable small tool equipment. The list includes 11 heavy duty and engine lathes, 2 shaping machines, 1 radial drill, 2 universal grinding machines, 2 milling machines, 1 upright drill, 1 hack saw and 1 wet tool grinder.

An interest in the United Machine & Mfg. Co., Canton, has been acquired by Cleveland men and two new directors representing Cleveland interests have been elected. These are P. R. Mather, of Pickands-Mather & Co., and H. B. Bole, vice-president Hydraulic Steel Co. The United company will shortly add to its present line of products the manufacture of underfeed stokers.

The Mansfield Wire Spoke Co., Mansfield, Ohio, has been incorporated with a capital stock of $250,000 and has secured equipment for a plant. Negotiations are pending for acquiring the present plant of the Ideal Electric Co., Mansfield, which will shortly move into new quarters. The officers of the new company are C. E. McElroy, president; A. M. Hall, vice-president, and B. E. Frasher, secretary and treasurer.

The Dillon Brothers Machine Co., Bridgeport, Ohio, has been incorporated with a capital stock of $150,000. It operates a machine shop and it is stated that later a new plant will probably be erected.

Reports from Elyria, Ohio, state that the American Radiator Co. is negotiating for the purchase of the Fox Furnace Co. of that city and that plans for acquiring the works will probably be completed shortly.

The International Steel Tie Co., Waterloo Road, Cleveland, is planning the erection of a one-story factory, 40 x 120 ft.

The Spangler Trap Shoot Mfg. Co., Chillicothe, Ohio, has been organized to manufacture a contrivance for throwing clay pigeons, used by trapshooters. The company has purchased machinery and operations will begin about Oct. 1.

The Shartle Machine Co., Columbus, Ohio, has purchased all of the power house equipment of the smokeless powder plant erected by the Government during the war at Nitro, W. Va. The purchase price was said to be in the neighborhood of $1,000,000.

Baltimore

BALTIMORE, Aug. 29.

The Adamantex Brick Co., Arbutus, near Baltimore, recently organized with a capital of $1,000,000 to manufacture sand-cement bricks, has awarded contract to the L. V. Thayer Construction Co., 25 West Forty-third Street, New York, for its plant, estimated to cost $150,000. The main building will be two stories, 160 x 268 ft., and will be supplemented with a number of smaller structures. Louis F. Ducker is president. The company is represented by Blum & Makover, Equitable Building, Baltimore.

The Continental Engineering & Equipment Co., Baltimore, manufacturer of water sprinklers, etc., has filed notice of change in name to the Central Automatic Sprinkler Co.

The Consolidated Gas, Electric Light & Power Co., Lexington Building, Baltimore, has sold a preferred stock issue totaling $2,500,000, the proceeds to be used in part for power extensions, improvements, etc. Herbert A. Wagner is president.

The Marlin Firearms Corporation, Wilmington, Del., has been incorporated under Delaware laws with capital of $3,450,000 to manufacture rifles, shotguns and other firearms. It is represented by the Corporation Trust Co. of America, duPont Building, Wilmington.

The Kelly Mfg. & Sales Co., 2503 West Lexington Street, Baltimore, has been chartered under State laws to manufacture mechanical toys and kindred products. The incorporators are John I. and Andrew J. Kelly and Harry F. Kimberley.

The Potomac Electric Power Co., 231 Fourteenth Street, N. W., Washington, has been granted permission by the District Public Utilities Commission to issue bonds for $2,600,000 for extensions, improvements, general operations, etc.

Robertson, Strader & Co., Greensboro, N. C., are planning to rebuild their machine shop, recently destroyed by fire with loss of about $30,000.

The Dalford Oil Refining Co., Wilmington, Del., has been incorporated under State laws with capital of $100,000,000 to construct and operate a series of oil refineries. The company is represented by the Corporation Trust Co. of America, duPont Building, Wilmington.

The Pitt Tractor Co., Wilmington, Del., has been incorporated with a capital of $400,000 to manufacture automobile tractors and parts. It is represented by the Colonial Charter Co., Ford Building, Wilmington.

The City Council, Springfield, Ga., is planning for the construction of a municipal electric light and power plant. The machinery installation is estimated to cost about $25,000. L. B. Ackerman, Jr., mayor, is in charge.

The Hampton Roads Equipment Co., 251 Arcade Building, Norfolk, Va., recently incorporated, will operate a local plant for the manufacture of road-building and conveying machinery, electrical equipment, etc. J. M. Sherrod is president and L. P. Beard, vice-president.

The Teal Light & Power Co., Chesterfield, S. C., is planning for the construction of a new power plant.

The Bristol Granite & Marble Works, Bristol, Va., is planning for the installation of new pneumatic and other machinery at its plant. John Shirreff is manager.

The Georgia Marble Co., Tate, Ga., is planning to rebuild its works recently destroyed by fire. New stone-handling and stone-working machinery will be purchased. The plant will be 85 x 300 ft.

The L. Rosenfeld Mfg. Co., 105 South Hanover Street, Baltimore, manufacturer of bakers' utensils, dairy utensils and other metal containers, is planning for the erection of a one-story addition, 40 x 125 ft. The machinery installation will cost about $25,000. The company recently increased its capital to $65,000. Louis Rosenfeld is president.

The Granite Falls Mfg. Co., Hickory, N. C., is arranging for the erection of a new hydroelectric generating plant on

Wilson Creek, near Lenoir, N. C. It will have an initial capacity of 5000-hp.

The American Box Co., Lynchburg, Va., is planning to rebuild its machine shop, recently destroyed by fire with loss of about $50,000.

Buffalo

BUFFALO, Aug. 29.

The Niagara Radiator & Boiler Co., Oliver Street, North Tonawanda, N. Y., has plans under way for a new one-story foundry, 140 x 175 ft., at Sixty-third Street and Woodland Avenue, Chicago, estimated to cost about $100,000. E. C. Andrews is president.

The Thomas Coupling Corporation, Dunkirk, N. Y., has been incorporated under Delaware laws with capital of $1,000,000 to manufacture couplings, clamps and other heavy mechanical products. R. W. Snow, Dunkirk, is representative.

The Buffalo Steel Car Co., Buffalo, has taken a contract for the reconstruction and repair of 500 hopper cars and 2000 box cars for the Buffalo, Rochester & Pittsburgh Railroad Co.

Fire, Aug. 19, destroyed the engine house and repair shop at the yards of the Pennsylvania Railroad Co., Eighteenth and Wayne streets, Erie, Pa., with loss estimated at about $125,000.

The Schloezer-Ash Mfg. Co., Buffalo, has been chartered under State laws to manufacture electric motors and kindred equipment. The incorporators are M. J. and L. F. Schloezer and J. H. Ash. The company is represented by William J. Volker, Mutual Life Building.

The Niagara Falls Power Co., Niagara Falls, N. Y., is planning for extensions in its electric transmission system, with new line from Niagara Falls to Buffalo, to cost in excess of $6,000,000, including steel towers, etc.

The Meldrum-Gabrielson Corporation, Industrial Building, Syracuse, N. Y., manufacturer of milling machines and parts, has awarded contract to Dawson Brothers, Union Building, for a one- and two-story plant on West Fayette Street, 60 x 160 ft., to cost about $75,000. A large portion of the structure will be equipped as a machine shop.

Detroit

DETROIT, Aug. 29.

Despite a steady increase in automotive and other machine production in this district and a larger number of inquiries noted, these encouraging features have not yet been reflected in the trade by any sales of importance. This is due in a large degree to the fact that prior to last December purchases of machine tools in the Detroit district were made in quantities which will largely take care of the demand for some time to come.

A steel wheel division has been formed by the Motor Wheel Corporation, Lansing, Mich., which is expected to get into production before the end of the year.

Construction is well under way on the new plant of the Stokes Mfg. Co., Owosso, Mich. It will manufacture a new manifold for motor vehicles.

The Steere Engineering Co., Owosso, Mich., and Detroit, has received an order for the installation of a condensation and gas cooling system at Havana, Cuba, to cost $50,000.

The Reynolds Spring Co., Jackson, Mich., will start immediately on the construction of an addition to care for increased business.

The Oliver Machinery Co., Grand Rapids, Mich., has added to its line of products a new type of belt sander, particularly adapted for the use of automobile body makers and for metal and wood-working plants.

The Standard Auto Co., Bridge Street and Gold Avenue, Grand Rapids, Mich., has completed plans for a new two-story and basement service and repair works and will commence erection at an early date.

The Wilton Tool & Mfg. Co., Grand River Avenue, Detroit, has arranged a list of new equipment to be installed at its plant for the manufacture of steel parts for automobiles.

The Detroit Tap, Die & Machine Co., Detroit, has filed notice of change of name to the Hawken Nut & Screw Co.

The Detroit Machine Products Co., Detroit, has been incorporated with a capital of $200,000 under Delaware laws by Edwin A. Leichfield and Walter A. Foster, Detroit, to manufacture machinery, tools, etc. It is represented by the Delaware Registration Trust Co., 900 Market Street, Wilmington, Del.

The City Council, Traverse City, Mich., will commence the immediate construction of its new hydroelectric generating plant on the Boardman River, estimated to cost about $250,000.

The Warner Auto Equipment Co., Benton Harbor, Mich., recently organized to manufacture shock absorbers and other automotive equipment, will carry out initial production at the plant of the National Axle Co., Benton Harbor. Later it is proposed to build a plant. Clarence T. Warner is president.

Indiana

INDIANAPOLIS, Aug. 29.

The Durant Motors of Indiana, Muncie, Ind., recently organized with a capital of $3,000,000, has taken over the local plant of the Sheridan Motor Car Co., to manufacture a six-cylinder automobile. Extensions and improvements will be made and new equipment installed. Plans are being perfected to commence production in October. Dennis A. Burke is president and general manager of the company, which is affiliated with the Durant Motors, Inc., 1819 Broadway, New York.

The Automatic Sliding Trolley Co., Frankfort, Ind., has been chartered under State laws to manufacture industrial trolley systems and kindred devices. The incorporators are William Robinson, J. A. Lucas and E. A. Spray.

The Interstate Car Co., Massachusetts Avenue, Indianapolis, manufacturer of automobiles, has awarded a contract to the Central State Bridge Co., Beecher Avenue, for a one-story foundry addition, estimated to cost about $25,000. E. H. Darrach is president.

The Concord Foundry Co., Elkhart, Ind., has filed notice of dissolution under State laws.

The Triangle Steel Products Co., Michigan City, Ind., will hold in abeyance the erection of its new plant, estimated to cost close to $75,000, until early next spring. The company is headed by T. C. Casse of the Josam Mfg. Co., 163 Washington Street, Chicago.

The Board of School Trustees, Angola, Ind., will make extensions and improvements in the electric power plant used for local schools.

The Central South

ST. LOUIS, Aug. 29.

The Missouri, Kansas & Texas Railroad Co., St. Louis, is having plans prepared and will soon take bids for a one-story addition to its machine shop at Parsons, Kan., 50 x 50 ft. A. L. Sparks, company address, is architect.

The Federal Penitentiary, Leavenworth, Kan., is planning for extensions and improvements in the power plant at the institution to cost about $115,000. New engines, boilers and auxiliary equipment will be installed. W. I. Biddle is warden in charge.

The Lexington Utilities Co., Lexington, Ky., has disposed of a bond issue of $560,000, the proceeds to be used in part for extensions and improvements in power plant and system.

The Commercial Coal Mining Co., Lexington, Ky., is planning for the installation of new electrical and other operating equipment on property recently acquired.

The Hygienic Heating & Ventilating Co., care of the Chamber of Commerce, Chillicothe, Mo., manufacturer of heating equipment, has acquired local property for the establishment of a new works.

The May Hosiery Mills, Nashville, Tenn., are planning for the establishment of a subsidiary plant for the manufacture of knitting machinery and parts. Julius Martin is secretary and treasurer.

Tabler Brothers, Pittsburg, Kan., will soon commence the erection of a new ice and cold storage plant, estimated to cost about $150,000 with machinery.

J. H. Mitchell, Kankakee, Ill., is planning for the establishment of a new plant at Joplin, Mo., to manufacture automobile trucks and parts. Negotiations are under way with the Joplin Chamber of Commerce for the purchase of a suitable site.

The City Council, Tulsa, Okla., is considering the construction of a municipal electric light and power plant. C. E. Griggs, city engineer, is in charge.

The Midwest Piping Co., 1452 South Second Street, St. Louis, has awarded contract to H. O. Hirsch & Co., Wainwright Building, for a one-story addition, 40 x 150 ft. A. G. Stoughton is president.

Swift & Co., Union Stock Yards, Chicago, are planning the erection of a new packing plant at Sedalia, Mo., to replace the words recently destroyed by fire.

The Chicago, Rock Island & Pacific Railroad Co., La Salle Street Station, Chicago, will take bids at once for the erec-

tion of a new engine house with locomotive repair works at Eldon, Mo. C. A. Morse is chief engineer.

The Peerless Wire Fence Mfg. Co., Adrian, Mich., has acquired property, 310 x 350 ft., at Memphis, Tenn., for a branch plant to manufacture wire fencing, staples and kindred products.

The Topeka Steam Boiler Works, Topeka, Kan., has filed plans for a four-story and basement works at Second and Jefferson streets, 50 x 85 ft.

Electric motors, automatic machinery for wood-working and other equipment estimated to cost about $20,000 will be installed at the plant of the Murphy Chair Co., Owensboro, Ky.

Milwaukee

MILWAUKEE, Aug. 29.

While the volume of new tool transactions remains restricted and sales are few and far between, the revival of the metal-working industry is progressing so well that machine-tool builders and dealers are encouraged over the prospect of an early resumption of buying. A general survey of the metal-working trade of Milwaukee and Wisconsin reveals greater activity probably than at any time within the last seven to eight months. Production of machine tools remains at a minimum pending the appearance of a healthier demand. Manufacturers of cranes are encouraged by increasing inquiry and better sales. The Pawling & Harnischfeger Co. sold a 5-ton electric traveling crane to the Consolidated Water Power & Paper Co., and several other fair-sized sales in this territory are pending.

The Perfection Hoist & Engine Co., Milwaukee, manufacturer of electrogenerating systems for farms and horizontal hoists for motor dump trucks, has purchased the former plant of the Two Rivers Plating & Mfg. Co., Two Rivers, Wis., and will move its factory and offices to that city on Sept. 1. The plant is undergoing some alterations and a small list of equipment will be purchased. Walter F. Mayer, 221 Grand Avenue, Milwaukee, is secretary.

The J. F. Davis & Sons Co., Chicago, which recently acquired the plant, equipment and business of the DePere Mfg. Co. at DePere, Wis., has completed alterations and placed the shop in operation. It will be conducted mainly as a boiler works, but will also fabricate structural steel. J. H. Allison is general manager at DePere.

The Victor Krefl Mfg. Co., Two Rivers, Wis., manufacturer of shock absorbers and other automotive accessories, has taken over the building formerly used as a machine shop by the Two Rivers Wooden Ware Co. and is installing some additional equipment. It has been occupying under lease the former plant of the Two Rivers Plating & Mfg. Co., which has recently been acquired by the Perfection Hoist & Engine Co., Milwaukee, as its permanent works.

The Marshfield Casket Co., Marshfield, Wis., has been incorporated with a capital stock of $25,000 to take over the plant and business of the Elgentone Mfg. Co., which is liquidating. The plant has been used for the manufacture of talking machine and music cabinets and will be partly retooled for manufacturing wooden and metallic caskets, etc.

The Northern Sash & Door Co., Hawkins, Wis., has awarded contracts for a new plant to cost about $65,000. It will consist of a main factory, 70 x 170 ft., a power plant, 30 x 42 ft., and a dry kiln, 36 x 45 ft., to be equipped with new machinery throughout and be ready for operations Jan. 1. Jens Jensdahl is president and general manager.

The Perron Signal Co., Sparta, Wis., has been organized to manufacture a vacuum type of traffic signal for motor vehicles, operated from engine exhaust. The new concern is a companion corporation of the Perron Spark Plug Co., established in Sparta two years ago. A. J. Perron is president of both concerns, which will be housed in the same plant. An addition will be erected later in the fall and some additional equipment is now being purchased.

The Milwaukee Board of Industrial Education will purchase shop equipment for the second unit of the new Central Continuation School in December or January. Much of the equipment for the first unit was acquired from Government tool stocks. Fred H. French is secretary of the board.

The Acme Grey Iron Foundry Co., Milwaukee, has been chartered with a capital stock of $25,000 to engage in the foundry and machine shop business. The incorporators are Warren J. Wheeler, Charles W. Brown and Arthur Breslauer, attorney, 740 Wells Building. A statement concerning the plans will be made shortly.

The Litman Bronze Co., Menomonie, Wis., producer of special bronze alloy castings, is seeking a location for its plant in Appleton, Wis. It is desired to come into close proximity to the paper mill industry of the Fox River valley.

The Gulf States

BIRMINGHAM, Aug. 29.

The Tidewater Glass Mfg. Co., Jacksonville, Fla., is planning for extensions in its plant to include a new metal-working department for the manufacture of caps for glass jars. It will build new works to cost $300,000.

Harry Whittier and William W. Shepard, Jacksonville, Fla., are organizing a company with capital of $3,000,000 to construct a new oil refinery with an initial daily capacity of 2000 bbl.

S. Pearson & Son, Ltd., Orizaba, Tex., operating oil properties, is planning the erection of an addition to its hydroelectric generating plant, with machinery to increase the capacity by about 50,000 hp.

The Maryland Refining Co., New Orleans, has commenced the construction of a new refinery to cost about $2,000,000.

The Safety Guard Rail Lock Co., Orlando, Fla., has been incorporated with a capital of $150,000 to manufacture rail locks, locking devices and other railroad equipment. W. L. Daughtry is president and R. B. Jarvis, secretary, both of Orlando.

The Dallas Railway Co., Dallas, Tex., is completing plans for the construction of an addition to its interurban railroad system from Dallas to Terrell, Tex., about 30 miles, estimated to cost $1,800,000, including rails, line equipment, electric stations, electrical and mechanical apparatus. C. W. Hobson is vice-president.

The Texas Oil Products Co., Waxahachie, Tex., has broken ground for a new oil refinery, estimated to cost about $500,000 including machinery.

The Key West Electric Co., Key West, Fla., is planning for extensions and improvements in its electric power plant to cost about $135,000, including the installation of new engine, generator and auxiliary operating machinery. B. L. Grooms is general manager.

The Jensen Ice Works, Jensen, Fla., is arranging for the erection of a new ice-manufacturing and refrigerating plant, estimated to cost $50,000. H. H. Schultz is general manager.

The Hercules Brick Co., Dallas, Tex., is perfecting plans for new works to cost about $75,000. A. B. Saling is general manager.

The Industrial Mfg. Co., Indianapolis, Ind., George A. Weaver, president, is planning the erection of a new pulp and paper mill in the vicinity of Orlando, Fla., to cost about $2,000,000. A site will be selected at an early date.

The Sawyer Specialty Scales Co., Jacksonville, Fla., has been incorporated with a capital of $500,000 to manufacture scales and similar products. W. H. Sawyer is president and W. E. Sawyer, secretary and treasurer.

California

LOS ANGELES, Aug. 23.

The Central California Ice Co., Fresno, Cal., has plans under way for enlargements in its ice-manufacturing plant. Considerable new machinery will be installed.

Rogers Aircraft, Inc., Los Angeles, has been incorporated with a capital of $150,000 by Emery H. Rogers, W. P. Holliday and M. M. Fogel, to manufacture airplanes and parts. It is represented by Fogel & Beman, Merchants' National Bank Building.

The American Auto Radiator Works, 1909 South Main Street, Los Angeles, has filed notice of organization to manufacture automobile radiators and other metal products. Louis Jacobs, 1170 East Twenty-fifth Street, heads the company.

The Wilgus Mfg. Co., Boyd and Wall streets, Los Angeles, manufacturer of oil burners, pump governors and other steam specialties, has plans under way for a new one-story plant, 50 x 120 ft., on property recently acquired.

The Los Angeles Gas & Electric Corporation, Los Angeles, is outlining an expansion and improvement program in electric generating plants and system over a term of years, with estimated cost placed at $5,850,000, including new machinery.

The McLaren Automobile Signal Co., Whittier, Cal., has been incorporated with a capital of $50,000 by Peter McLaren, George L. Hazzard and Rex B. Kennedy, Whittier, to manufacture automobile signal devices and other automotive equipment. It is represented by James S. Bennett, Van Nuys Building, Los Angeles.

The Asphaltum & Refining Co., Los Angeles, has preliminary plans under way for the erection of a new refinery near Long Beach. George Zeeman is president and general manager.

Swift & Co., Chicago, have plans under way for a one-story addition to their meat plant at 922 East First Street, Los Angeles, with installation to include refrigerating machinery and other equipment.

BOOK REVIEWS

The Human Motor. By Jules Amar, D.Sc. Pages, xvi + 470; 5½ x 8½ in.; illustrations and numerous tables, 309. Published by George Routledge & Sons, Ltd., London, and E. P. Dutton & Co., New York.

This unusual work, whose author is the director of the research laboratory of industrial labor at the Conservatoire National des Arts et Métiers, Paris, France, has been translated from the French by Elsie P. Butterworth and George E. Wright. It has for an optional title "The Scientific Foundations of Labor and Industry," and, according to the preface, the author hopes his work may stimulate further research into fields first brought forcibly to the attention of the public by Chauvean and Taylor. According to the publisher's note this work was published in France in 1914, but on account of war conditions an English edition was not heretofore available. It is the publisher's expressed belief, however, that this delay has not affected the value of the book, owing to the general suspension of such experimental research (except as applied to re-education of the disabled) during the war.

As the title suggests, the human body (or motor) is considered in terms analogous to an inanimate body (motor) capable of transforming energy into work. For the benefit of the lay mind the first 84 pages are devoted to a concise summary of the general principles of mechanics.

A discussion of the "Human Machine" follows, taking up the structure of the matter constituting the organs of living machines, and describing the organs of movement and locomotion, or the bones, muscles and tendons. Since the motor in the human body is the muscle, and the muscle functions like a heat engine, a description of its functioning and its fuel (alimentation) follows. After this is treated human energy under the divisions of the laws of energetic expenditure, the yield of the human machine and the physiological effects of fatigue.

Man and his environment are then discussed. The "internal environment" or the blood and the influence of aliments upon it, and the external environment or the atmosphere, temperature, clothing, at various altitudes and under varying conditions, are all taken into consideration and treated in detail.

Thus about two-thirds of the work are given over to establishing the analogy between inanimate and animate motors. Some 70 pages are then given over to a description of the experimental methods, including measurements and instruments, the dynamic elements of the human machine and the measurement of energy. The remainder of the work under the general head of "industrial labor" discusses the human body in equilibrium and movement, industrial labor and locomotion, the tools of industrial labor; and finally the general conclusions of the author. The work is replete with experimental data of all kinds and as the author suggests, should stimulate leaders of scientific thought to attempt even more complete treatment of the subject.

E. C. R.

Employee Training. By John Van Liew Morris, Ph.D. Pages, xxiii + 311, 5½ x 8 in. Published by McGraw-Hill Book Co., Inc., New York.

Since the title might be used for books very different in character, it is advisable to note that in this instance the book consists merely of a very comprehensive compilation of the methods used in the training and educational departments of various corporations throughout the country. The compilation evidently was carefully planned for, since it is confined to metal working industries, electrical equipment manufacturers, shipbuilding and railroads, with one example in the printing industry.

The subject matter of the compilation is based on information gathered in personal visits and supplied by educational and training executives. This is grouped under four main heads of programs for apprenticeship and special training; programs emphasizing apprenticeship; programs emphasizing special training; and programs of primarily technical instruction. After setting forth the findings in this matter, an academic discussion of them at some length follows, and then a brief chapter on conclusions. There is included a selected bibliography and complete index.

The data for this book seem to have been obtained carefully and accurately, and are reproduced in sufficient detail to make the book of considerable value for reference purposes.

Labor's Crisis. By Sigmund Mendelsonn. Pages, xii + 171, 4½ x 7¼ in. Published by the Macmillan Co., New York.

An employer's views and analysis of labor problems, based upon the practical experience of an employer, are given in this very interesting and readable little book. Taking as his basis the fact that a labor problem exists, the author tries to show wherein it differs in this twentieth century from that of the nineteenth. In other words, insufficiency of labor, the inflated wage and the striving for economic dominance by labor constitute for the employer a very different one to-day.

To the author this whole problem seems to revolve about the matter of the number of working hours per day. Arguing that "acute labor shortage cannot be materially relieved by new inventions nor by the more intensive application of labor-saving machinery and devices," and that from a 12 and 14-hr. day we have come to an 8-hr. day, with efforts toward a still shorter work day gaining ground, he discusses both the economic effect and the moral effect of this curtailment of labor.

The nature and effect of poverty as related to labor, labor welfare as related to material and social welfare and labor as it affects the wife and the home are other phases of the problem touched upon.

The Automobile Industry and Its Future. By Leonard P. Ayres, vice-president Cleveland Trust Co., Cleveland, Ohio. This pamphlet of 32 pages is the second of the economic series of the Cleveland Trust Co., the first, also by Mr. Ayres, being on "Price Changes and Business Prospects." A feature of the discussion of the automobile industry is a table presenting in outline the statistical history of the industry from its beginning more than 25 years ago. There is also a description of a new method for computing the elimination of cars year by year. The prognosis of automobile use and production is particularly interesting. The number of cars manufactured up to the beginning of 1921 is put at 11,775,000, of which more than 700,000 have been exported. About 9,000,000 are in use and 2,000,000 have been worn out, destroyed or abandoned. The average term of service has been about six seasons. At the end of 1920 one car was in use for each 12 people in the population. Since 1916 the increases in the annual output have been largely for the increasing demand for Ford and other relatively inexpensive cars, and for some time to come the new users will be people of limited means who will buy inexpensive cars. It is believed the country will shortly need about 1,500,000 cars annually if the use of automobiles remains about at its present status. The production capacity is more than 2,500,000 cars per year. Extensive price readjustments may be expected in the next few years, the author believes, as the industry with its great capacity competes for purchasers among people and countries whose buying power has been sharply curtailed.

South African Engineers' Directory.—Electrical and allied trades, including a complete mining directory. Pages X + 481, 6½ x 9½ in. Compiled and published by the South African Mining and Engineering Journal, Johannesburg, Union of South Africa.

This directory covers South Africa and has been planned to embrace every branch of engineering (electrical, iron, steel, machinery, constructional and automobile) and also the hardware business throughout the Union, Rhodesia and Mozambique. It classifies the personnel of the various trades alphabetically and geographically.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Metal Markets."

Iron and Soft Steel Bars and Shapes

	Per Lb.
Bars:	
Refined bars, base price	2.78c.
Swedish bars, base price	12.00c.
Soft steel bars, base price	2.78c.
Hoops, base price	3.88c.
Bands, base price	3.43c.
Beams and channels, angles and tees 3 in. x ¼ in. and larger, base	2.88c.
Channels, angles and tees under 3 in. x ¼ in., base	2.78c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	2.75c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	2.95c.
Toe calk, ½ x ⅜ in. and larger	3.45c.
Cold-rolled strip, soft and quarter hard	10.00c. to 10.50c.
Open-hearth spring steel	4.25c. to 8.00c.
Shafting and Screw Stock:	
Rounds	4.38c. to 4.53c.
Squares, flats and hex	4.98c. to 5.03c.
Standard cast steel, base price	14.00c.
Extra cast steel	17.00c.
Special cast steel	22.00c.

Tank Plates—Steel

¼ in. and heavier	2.88c.

Sheets

Blue Annealed

	Per Lb.
No. 10	3.53c.
No. 12	3.58c.
No. 14	3.63c.
No. 16	3.73c.

Box Annealed—Black

	Soft Steel C. R., One Pass Per Lb.	Blued Stove Pipe Sheet Per Lb.
Nos. 18 to 20	3.80c. to 4.05c.	.....
Nos. 22 and 24	3.85c. to 4.10c.	4.50c.
No. 26	3.90c. to 4.15c.	4.55c.
No. 28	4.00c. to 4.25c.	4.65c.
No. 30	4.25c. to 4.50c.	.....

No. 28, 36 in. wide, 10c. higher.

Galvanized

	Per Lb.
No. 14	4.10c. to 4.35c.
No. 16	4.25c. to 4.50c.
Nos. 18 and 20	4.40c. to 4.65c.
Nos. 22 and 24	4.55c. to 4.80c.
No. 26	4.70c. to 4.95c.
No. 27	4.85c. to 5.10c.
No. 28	5.00c. to 5.25c.
No. 30	5.50c. to 5.75c.

No. 28, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Blk.	Galv.	*Wrought Iron*	Blk.	Galv.
½ in. Butt..	—48	—32	¾ in. Butt....	—22	—4
¾ in. Butt..	+54	+39	1-1½ in. Butt.	—24	—6
1-3 in. Butt..	—56	—42	2 in. Lap.....	—14	—1
3½-6 in. Lap.	—51	—37	2½-6 in. Lap.	—22	—6
7-12 in. Lap..	—43	—27	7-12 in. Lap...	— 7	+4

Steel Wire

BASED PRICE* ON No. 9 GAGE AND COARSER	Per Lb.
Bright basic	4.00c. to 4.25c.
Annealed soft	4.00c. to 4.25c.
Galvanized annealed	4.75c. to 5.00c.
Coppered basic	4.50c. to 4.75c.
Tinned soft Bessemer	6.00c. to 6.25c.

*Regular extras for lighter gages.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	15¾c. to 18¾c.
High brass wire	16¾c. to 21¼c.
Brass rod	13¾c. to 20¼c.
Brass tube, brazed	27 c. to 31 c.
Brass tube, seamless	18½c. to 20 c.
Copper tube, seamless	20 c. to 22¼c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 20c. to 23c. per lb. base.

Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14x20		
			Primes	Wasters
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	80 lb....	$6.80	$6.55
		90 lb....	6.90	6.65
		100 lb....	7.00	6.75
IC..	$10.60	$9.50	IC...	7.20	6.95
IX..	11.80	10.75	IX...	8.10	7.85
IXX..	13.60	12.25	IXX...	9.10	8.85
IXXX..	15.60	14.25	IXXX...	10.50	10.25
IXXXX..	17.20	16.00	IXXXX...	11.50	11.25

Terne Plates

8-lb. Coating 14 x 20

100 lb.	$7.50
IC	7.75
IX	8.00
Fire door stock	11.00

Tin

Straits pig	29c.
Bar	36c. to 37c.

Copper

Lake ingot	15c.
Electrolytic	15c.
Casting	15c.

Spelter and Sheet Zinc

Western spelter	6c.to 6¼c.
Sheet zinc, No. 9 base, casks	11½c. open 12c.

Lead and Solder*

American pig lead	5½c.
Bar lead	6¼c. to 6¾c.
Solder, ½ and ½ guaranteed	20¼c.
No. 1 solder	18½c.
Refined solder	15¾c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	80c.
Commercial grade, per lb	40c.
Grade D, per lb	35c.

Antimony

Asiatic	6c. to 6½c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb	29c. to 31c.

Old Metals

The market is very quiet with no business. Dealers' buying prices are nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible	9.50
Copper, heavy and wire	8.75
Copper, light and bottoms	7.50
Brass, heavy	4.50
Brass, light	3.75
Heavy machine composition	7.50
No. 1 yellow brass turnings	4.00
No. 1 red brass or composition turnings	6.25
Lead, heavy	3.50
Lead, tea	2.00
Zinc	2.50